

OPERATOR MANUAL

Basil® 3500 Cage and Bottle Washer

(2006/06/14)

P122998-741

A WORD FROM STERIS CORPORATION

This manual contains important information on the proper use of this equipment. Refer to **SECTION 6, ROUTINE MAINTENANCE**, for instructions in routine care of this washer. **All personnel and department heads are urged to carefully review and become familiar with the Safety Precautions and instructions contained herein.** These instructions are important to protect the health and safety of personnel operating this **Basil® 3500 Cage and Bottle Washer** and should be retained in a conveniently accessible area for quick reference. This equipment is specifically designed only for the uses outlined in this manual.

Complete instructions for uncrating and connecting utilities, as well as equipment drawings, have been provided. If they are missing, contact STERIS for replacement copies, providing the serial and model numbers of the unit.

Advisory

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this washer/disinfector can be found in SECTION 1. Do not operate the equipment until you have become familiar with this information.*

Any alteration of this equipment not authorized or performed by STERIS will void the warranty. Alteration of equipment which could adversely affect its operation and efficacy may violate national, state, and local regulations, and could jeopardize your insurance coverage.

Indications For Use

The **Basil 3500 Cage and Bottle Washer** is specifically designed for thorough, efficient cleaning of cages, bottles, debris pans, and miscellaneous items used in the care of laboratory animals.

This washer is specifically designed to only Process goods as outlined in this manual. If there is any doubt about a specific material or product, contact product manufacturer for recommended washing technique.

Service Information

A thorough preventive maintenance program is essential to help ensure safe and proper equipment operation. Customers are encouraged to contact STERIS concerning extended service maintenance agreements to give the equipment planned maintenance.

A global network of skilled service specialists can provide periodic inspections and adjustments to help ensure low-cost peak performance. STERIS can provide information regarding the annual maintenance agreements.

STERIS carries a complete line of accessories for use in this equipment. Please, contact STERIS for details.

Manufacturer: Corporation STERIS Canada Beauport, Qc, CANADA	ISO 13485 ISO 9001 Certified Facility
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The base language of this document is ENGLISH. Any translations must be made from the base language document.

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SAFETY PRECAUTIONS

1

The following *Safety Precautions* **must** be observed when operating and servicing this Basil® 3500 Cage and Bottle Washer. WARNING indicates potential for personal injury and CAUTION indicates potential for damage to equipment. For emphasis, certain *Safety Precautions* are repeated throughout the manual. **It is important to review ALL *Safety Precautions* before operating and servicing the unit.**

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:



Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel, or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding service options.



Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.

WARNING – ELECTRIC SHOCK HAZARD:



Always set building electrical-supply disconnect switch and console master power switch to OFF before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.

WARNING – BURN HAZARD:



Before performing any service on unit, wait until chamber and piping cool to room temperature.



Do not reach into sump.



Pipes may be extremely hot.



Water discharge may be extremely hot.



Wear appropriate Personal Protective Equipment (PPE) including gloves and face protection, open door slowly, and allow chamber and load to cool when cycle is complete. Hot steam may escape through door opening if door is fully opened after cycle is complete.

WARNING – SLIPPING HAZARD:



To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

WARNING – CHEMICAL BURN HAZARD:



Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow.

- Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines.
- Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.



Wear appropriate Personal Protective Equipment (PPE) including gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If chemical product was swallowed or in contact with eyes or skin, read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) and seek medical attention immediately.

CAUTION – POSSIBLE EQUIPMENT DAMAGE:



Always use a silicone lubricant to lubricate squeeze tubes. Petroleum based lubricants, such as Vaseline® or grease, will cause squeeze tubes to melt.



Failure to connect wires to proper terminals may result in damage to, or malfunctioning of, unit when power is applied.



Never use rinse-dry chamber as a sink. Under no circumstances should waste water be poured into it as water could overflow drain and damage delicate components.



Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Cleaners rubbed in a circular motion or applied with a wire brush or steel wool will damage stainless steel. Do not use these cleaners on painted surfaces.



Repeated fuse burnouts indicate a short circuit or overload. Trouble should be located and corrected by a fully trained technician.



When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content will damage stainless steel.

Tables 1-1 and 1-2 contain symbols which may be on your Basil 3500 Cage and Bottle Washer components:

Table 1-1. Definition of Symbols on Unit













Symbol	Definition
	Protective Earth (Ground).
	Transfer of Heat, Hot Surface.
	Rotation: Direction of Rotation Device.
	Reset.
	CAUTION. High Voltage.
	ELECTRICAL EQUIPMENT. Authorized Personnel Only.
	WARNING. Disconnect Main Power switch before opening cover and working on electrical components.
	WARNING. For continued protection against fire hazard replace only with same type and rating of fuse.
	DANGER. Do not Operate Without Guards in Place.
	WARNING! Chemical Burn Hazard: Washer detergents are caustic... Read and follow the precautions... Wear protective gloves...
	WARNING. Burn Hazard. Surface May Be Hot.
	CAUTION. Always Cut OFF Electrical Supply Before Doing Any Repair.

Table 1-2. Definition of Symbols on Identification Nameplate

Symbol	Definition
MODEL	Model Number of The Unit.
S/N	Serial Number of The Unit.
YEAR	Year of Manufacture of The Unit.
kVA	Kilovolt-Ampere.
V_~	Volt, Number of Phase (3 or 1[blank]), Alternate Current.
A	Amperage.
Hz	Hertz – Frequency of The Unit.
WIRE	Number of Wires In The Electrical Cable (Ground Not Included).
PE	Protective Ground Wire.



IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.

2.1 Technical Specifications

Complete uncrating and installation instructions, as well as an equipment drawing have been furnished. If any of these documents are missing or misplaced, contact STERIS giving serial, equipment, and model numbers of the unit. Replacement copies will be sent to you promptly.

These specifications are intended to describe technical information given on nameplate of your washer and to state other relevant information. Check equipment drawing or identification nameplate for proper voltage and amperage.

2.1.1 Voltage, Amperage and Power Consumption

Basil® 3500 Cage and Bottle Washer operates on:

- Steam-Heated units:
208 V, 60 Hz, 3-phase;
480 V, 60 Hz, 3-phase.
- Electric-Heated units:
480 V, 60 Hz, 3-phase.

A protective ground is required (Class 1 Equipment).

Maximum currents and power consumptions are indicated on nameplate.

Main supply voltage not exceeding $\pm 10\%$ of nominal voltage.

Installation category: Overvoltage Category II.

Always follow local electrical installation codes.

Refer to *Uncrating/Installation Instructions* (P122996-977) for proper connection.

2.1.2 Permissible Environmental Conditions

This equipment is designated to give optimal results under the following conditions:

Indoor use only;

Altitude of operation up to: 6,267 ft (2,000 m);

Maximum relative humidity is 80% for temperatures up to: 88°F (31°C) decreasing linearly to 50% relative humidity at 104°F (40°C);

Pollution degree 2.

2.1.3 Seismic Anchorage System

A Seismic Anchorage System is available for high risk seismic zones.

2.2 Installation Checklist

After your washer has been installed by qualified service technicians, complete the following checklist to assure installation is complete and correct. If you desire, contact STERIS and schedule a technician to test installation and demonstrate proper equipment operation.

- ☐ To allow service of unit without shutting off building supply lines, shutoff valves (not provided by STERIS) for maintenance purposes, are installed on steam and water lines to unit. Shutoff valves must be capable of being locked in OFF position only.
- ☐ Disconnect switches (not provided by STERIS) are installed in electric supply lines near washer and within 10' (3 m) of electrical control box. Disconnect switches must be capable of being locked in OFF position only.

NOTE: If washer is installed next to other equipment, shut-off valves and disconnect switch should be placed so that service can be shut off to one piece of equipment at a time.

- ☐ Washer is positioned as shown on equipment drawing with required service clearance space and in relation to building supply lines.
- ☐ Washer must be installed between two walls with a key-locked service door so service side is not accessible to operators.
- ☐ Building steam line provides maximum dynamic steam pressure and flow rate to washer as specified on equipment drawing.
- ☐ Drip leg with steam trap installed in steam supply line.
- ☐ Building hot water line supplies water to washer at pressure and temperature specified on equipment drawing.
- ☐ If applicable, building cold water line supplies water to washer at pressure specified on equipment drawing.
- ☐ Electrical supply for washer is as specified on equipment drawing.

- ☐ Condensate returns are sized as specified on equipment drawing.
- ☐ Vent connections are sized as specified on equipment drawing.
- ☐ Recirculation pump pressure is within 25 to 60 psig.
- ☐ Recirculation pump motor rotating in direction shown by arrow.
- ☐ Self-cleaning screen assembly functioning properly.
- ☐ Header drive system functioning properly.
- ☐ All piping is leak-free.
- ☐ Chamber sump steam coil functioning properly.
- ☐ Cabinet joints are completely sealed, no leaks. (For verification, run machine for half an hour.)
- ☐ Door safety switch(es) functioning properly.

COMPONENT IDENTIFICATION

3



IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.

3.1 Component Identification

Basil 3500® Cage and Bottle Washers are heavy duty, large capacity hydrospray washers designed for thorough, efficient cleaning of cages, bottles, debris pans and miscellaneous items used in the care of laboratory animals.

Washer is equipped with a user-programmable microcomputer control system capable of storing up to twelve treatment cycles to process a wide variety of loads. Computer control system monitors and automatically controls all cycle operations.

Before operating washer, it is important to become familiar with all control locations and functions (see Figure 3-1).

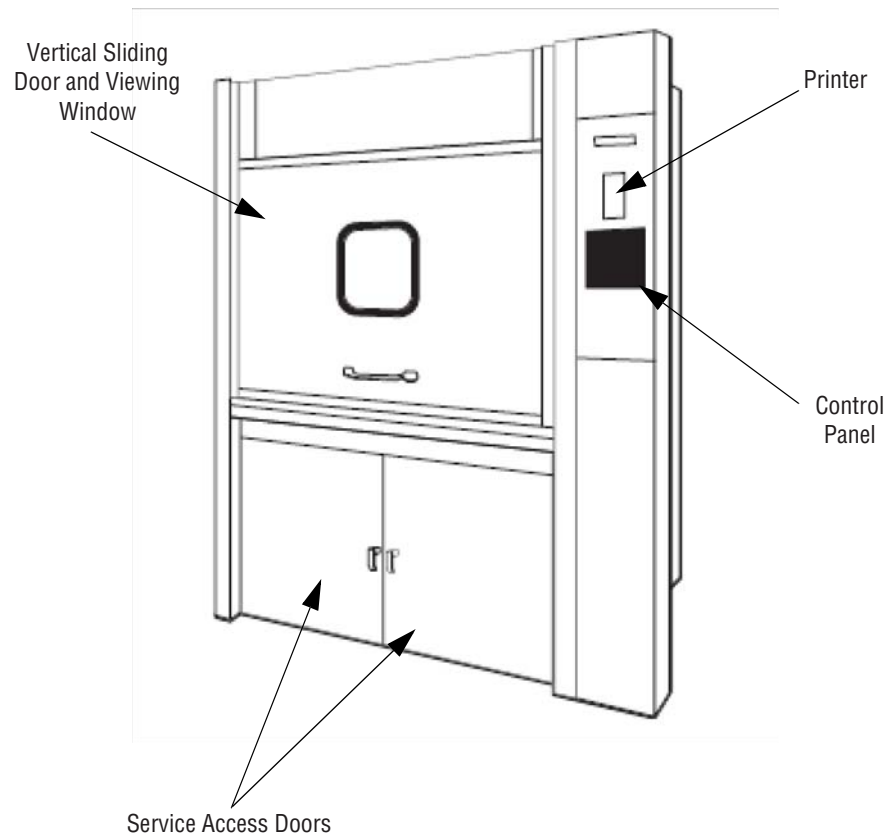
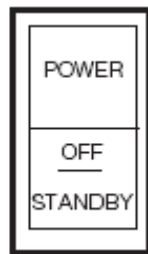


Figure 3-1. Basil 3500 Cage and Bottle Washer Components

3.2 Power Switch

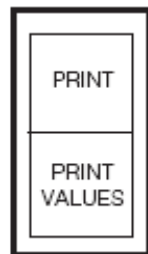


POWER-OFF/STANDBY switch, located behind printer door, includes two settings which direct operation of control (see Figure 3-2).

- **POWER** - Press top portion of rocker switch to initialize controls and enable unit operation.
- **OFF/STANDBY** - press bottom portion of rocker switch to initiate Shutdown cycle and turn off all ac power to control (Standby mode). While in Standby mode, unit operation is not possible.

NOTE: Control should be placed in Standby mode after last cycle of day and when washer is not in use for an extended period of time.

3.3 Printer



Printer records pertinent cycle data on 2-1/4 inch wide single-ply thermal paper. Refer to *SECTION 6, ROUTINE MAINTENANCE*, for information on changing paper roll and storing thermal paper.

Printer is located inside of load-side control panel, to the right of load door.

Printer Function Switch controls the following two printer functions:

- **PRINT** - Pressing top portion of Printer Function Switch generates a printout of alkaline and acid detergent setpoints (if conductivity option) and all RTD temperatures (actual water temperature).
- **PRINT VALUES** - Press bottom of Printer Function Switch to generate a complete printout of all cycle values.

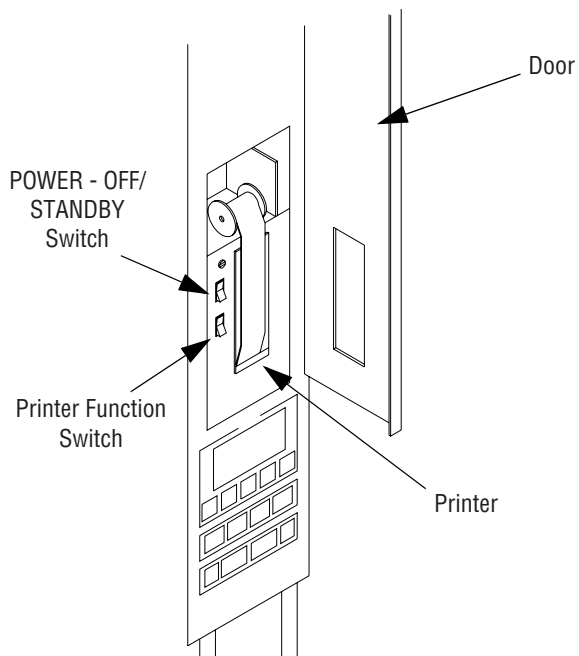
3.4 Load-Side Control Panel

Load-side control panel is used to direct all washer functions. Operator may program specific cycles, review and select cycles, start, stop, or reset cycle operation, extend or by-pass cycle phases, and monitor cycle performance from control panel.

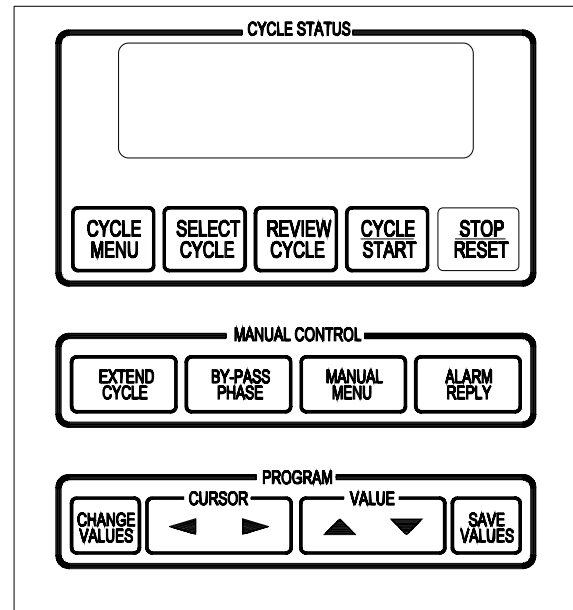
Standard load-side control panel includes a printer.

3.4.1 Display Screen

Two-line alpha-numeric screen displays cycle program data on demand, in-cycle performance data, and operator instructions. Display screen also indicates certain abnormal conditions that may occur during a cycle (see Figure 3-2).



Load-Side Control and Printer



Front Control Panel

Figure 3-2. Control Panel and Printer

3.4.2 Touch Pads

Cycle Status Touch Pads:



- **CYCLE MENU** - Press to view first cycle menu. Press again to advance screen to next cycle menu. Three menus are available, each with four cycles.



- **SELECT CYCLE** - Press until desired cycle name flashes.

NOTE: When a displayed cycle name or phase value is selected, corresponding word or digit flashes.



- **REVIEW CYCLE** - Press to review cycle phases and values programmed for selected cycle.



- **CYCLE/START** - Press once to display name of selected cycle. Press a second time to start cycle.

NOTE: Selected cycle name remains on screen for 5 seconds after pressing CYCLE/START touch pad once. To start a cycle, CYCLE/START touch pad must be pressed a second time while selected cycle name is displayed. If touch pad is not pressed within 5 seconds, screen automatically returns to Cycle Menu.



- **STOP/RESET** - Press once to stop operation of a cycle. Press a second time to abort cycle and return screen to cycle menu.

NOTE: When cycle is stopped, press CYCLE/START touch pad once to resume cycle operation. Cycle operation resumes at beginning of interrupted phase function (i.e., filling, recirculating, draining). When cycle is aborted, cycle operation is discontinued and cycle must be restarted from the beginning of cycle.

Manual Control Touch Pads:



- **EXTEND CYCLE** - Press to temporarily increase selected phase time. On completion of cycle, phase time returns to programmed set point.



- **BY-PASS PHASE** - Press to by-pass specific phase in progress and advance cycle to next phase.

NOTE: BY-PASS PHASE touch pad can only be used when a cycle is in progress. During cycle, filling and draining functions cannot be by-passed. In addition, a phase can not be by-passed if Temperature Guarantee feature is selected for that phase.



- **MANUAL MENU** - Press to view washer functions which can be controlled manually.



- **ALARM REPLY** - Press to turn off alarm buzzer and acknowledge displayed alarm message. Refer to *SECTION 7, TROUBLESHOOTING*, for specific alarm conditions and corrective actions.

Program Touch Pads:



- **CHANGE VALUES** - Press to access Change Values mode. Change Values mode allows authorized operators to change user-programmable items. Refer to *SECTION 5, CYCLE AND CONTROL VALUE PROGRAMMING*, for details on Change Values mode.

NOTE: Examples of user-programmable items include cycle name, phase temperature, phase time, and questions regarding phase options (e.g., retention of final rinse water).



- **CURSOR Arrows** - Press until item to be changed (word, letter, or number) flashes.



- **VALUE Arrows** - Depending on item flashing (selected), press to either toggle between answer selections or scroll through alphabet and numbers 0 through 9.

NOTE: Alphabet includes characters for an underline and a space ().



- **SAVE VALUES** - Press to save changes made, exit Change Values mode and return screen to cycle menu.

3.5 Unload-Side Control Panel

If washer is equipped with a double door for pass-through operation, an additional control column is installed on unload side of unit. This second control column is wired directly to main control processor and includes a control panel. Unload-side control panel features same touch pads and display as load-side control panel. Display window concurrently shows same message as shown in display window on operating end of unit.

Standard unload-side control panel does not include a printer.

3.6 Typical Printouts

* CONTROL ON	8:32:31A	
	4/21/92	

Customer Name	Basil	
Model	3500	
S/N	00000000	

=====		
CYCLE - CYCLE 1		
=====		
CYCLE START	8:37:33A	
CYCLE DATE	4/21/92	
CYCLE NUMBER	0000001	
UNIT NUMBER	0000000	
=====		
PHASE	TIME	F

PRE-WASH	8:38:03A	141.5
	8:39:03A	135.0
DET-WASH	8:41:33A	146.3
	8:46:33A	144.2
RINSE #1	8:49:10A	183.5
	8:50:40A	182.7
RINSE #2	8:53:00A	184.0
	8:54:30A	182.5
F. RINSE	8:57:20A	184.3
	8:58:50A	183.8
EXHAUST	8:59:50A	

COMPLETE	9:01:20A	

MAX WASH TEMP=	146.3F	
MAX RINSE TEMP=	184.3F	
CYCLE TIME=	0:23:27	
=====		
READY TO UNLOAD		
=====		
DOOR OPENED	9:03:42A	

Figure 3-3. Sample Printout

Figures 3-3 and 3-4 are examples of typical cycle printouts.

- **POWER UP**

When Power Switch is set to **POWER**, generated printout lists time and date, control was turned on, and unit's serial number.

- **CYCLE START**

When **CYCLE/START** touch pad is pressed twice to begin selected cycle, generated printout lists name of cycle started, time and date cycle was started, cycle number, and unit number.

- **IN-CYCLE PERFORMANCE**

During a cycle, generated printout lists start and end time of each phase, along with actual temperature of solution/water in chamber sump.

- **END-OF-CYCLE PERFORMANCE SUMMARY**

At end of a cycle, generated printout lists time cycle was completed, maximum wash and rinse temperatures reached during cycle, and total cycle processing time.

- **ALARM CONDITION**

When an alarm condition occurs, generated printout lists type of alarm and time it occurred (see Figure 3-4). Once operator presses **ALARM REPLY** touch pad, generated printout lists time when alarm was acknowledged.

PHASE	TIME	F

PRE-WASH	10:16:02A	167.3
	10:17:02A	166.8
* ALARM	10:18:02A	
SUMP		
- TOO LONG TO DRAIN		

ALARM ACKNOWLEDGED		
	AT 10:18:15A	

Figure 3-4. Sample Alarm Printout

3.7 Oscillating Jet System

Oscillating jet system consists of one oscillating spray header with machined jets mounted above, below, and on each side of wash chamber (see Figure 3-5). Machined spray jets are angled to reach all surfaces of load.

Oscillating jet system travels back and forth along length of chamber during recirculating/spraying phase function. Jet system is equipped with a safety clutch that stops movement of oscillating header when an obstruction is detected.

Chamber door(s) is equipped with a safety switch to stop washer operation if door is opened during a cycle, and to prevent start of washer operation if door is not securely closed.

Oscillating jet system is equipped with a mechanical clutch to disengage carriage drive if an obstruction is encountered, preventing damage to spray header and load items.

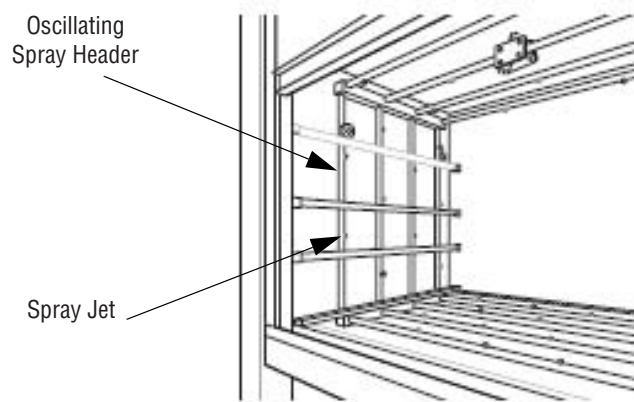


Figure 3-5. Oscillating Jet System

3.8 Safety System

Load-side and, if washer is equipped with double-door feature, unload-side control panels are equipped with red-colored **STOP/RESET** touch pads. Press touch pad once to stop cycle operation and twice to abort cycle.

3.9 Automatic Detergent Injection System



WARNING – CHEMICAL BURN HAZARD: Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines. Wear appropriate Personal Protective equipment (PPE) whenever handling detergent or servicing detergent pump or lines.

Automatic Detergent Injection System includes a peristaltic pump mounted to washer exterior.

If using alkaline detergent with the injection system, alkaline detergent is automatically injected into chamber sump during Wash treatment of a cycle. Detergent is injected for a programmed time interval while sump is filling with hot building-supply water.

If using acid detergent with injection system, acid detergent is automatically injected into chamber sump during Acid Wash phase of a cycle. Detergent is injected for a programmed time interval while sump is filling.

NOTE: Washer must be equipped with an acid detergent system option for acid detergent to be used.

3.10 Drain Discharge Cooldown System with Cold Water Injection

Washer drain system is piped to automatically cool all drain discharges using building cold water supply.

During draining function of each phase, cold tap water is injected into washer drain line as washer drain discharges are sent directly to building drain system.

3.11 Exhaust Fan

During unit operation, exhaust fan removes residual vapors from wash chamber and directs vapors to building exhaust duct.

3.12 Vapor Condensing Exhaust System

Vapor Condensing Exhaust System consists of a vapor condenser, mounted to side of washer, and an exhaust fan, mounted on top of washer. Unit width and height are increased by 14" and 7.5" (355 mm and 190 mm).

During unit operation, residual vapors are automatically removed from wash chamber and directed to vapor condenser. Vapors are then cooled, condensed, and directed to building drain system.

3.13 Heat Exchanger

Washer is equipped with a steam heat exchanger and valving system to preheat incoming fill water, reducing normal water/solution heat-up time.

System is fully automatic and works during filling phase of all cycle treatments.



IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.

4.1 Before Operating Washer



WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or drippage. If spills or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).



WARNING – CHEMICAL BURN HAZARD: Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.



WARNING – BURN HAZARD: Pipes may be extremely hot.

1. Verify building electrical supply disconnect switch (circuit breaker) is positioned to ON. Verify steam and water supply valves are open.
2. Open chamber door and verify wash chamber is empty.
3. Verify vortex plate, located under load grating, is free of debris (see Figure 4-1).
4. Verify detergent supply (remotely located). Ensure supply hose is correctly placed in detergent container and detergent pump is turned on.

NOTE: Always use a non-foaming detergent for effective cleaning and proper pump and water level control operation. To achieve maximum cleaning efficiency, select detergent appropriate to soil type being processed.

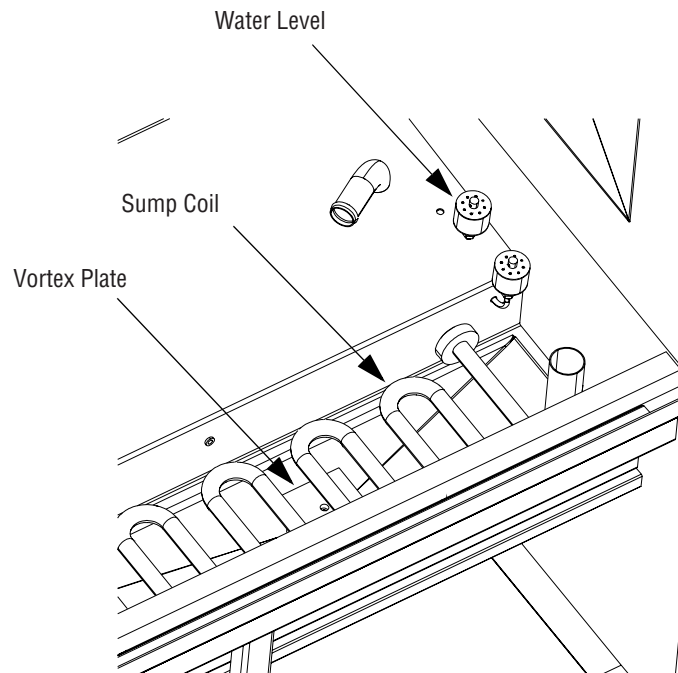


Figure 4-1. Vortex Plate

4.2 Loading Unit

1. Open chamber door and load wash chamber (see Figure 4-2). Ensure all cages, bottles, etc. are correctly positioned on load grating or in an accessory rack.
2. Verify clearance space on both sides of loaded items permits unobstructed movement of oscillating jet system.
3. Close chamber door(s) securely.

NOTE: Door safety switch prevents cycle operation unless door(s) is closed.

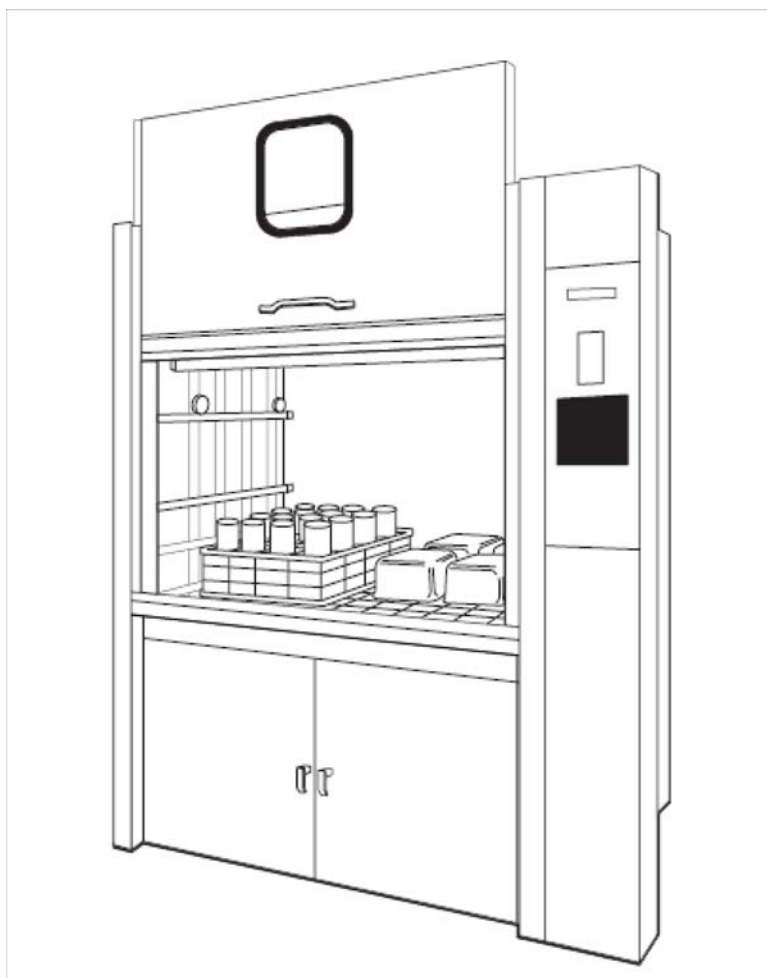


Figure 4-2. Loading Washer

4.3 Cycle Operation

Basil® 3500 Cage and Bottle Washer is equipped with a microcomputer control capable of storing parameters for twelve distinct cycles. Authorized operators have capability of customizing/programming all cycles to meet specific washing needs. Cycle programming may be limited by access code to assure process integrity. For instructions on cycle programming or changing cycle parameters, refer to *SECTION 5, CYCLE AND CONTROL VALUE PROGRAMMING*.

On initial receipt of washer, each cycle is set with a basic cycle consisting of six sequential treatments – Pre-Wash, Wash, First Rinse, Second Rinse, Final Rinse, and Exhaust. See **Table 4-1** for phase values of demonstration cycle.

Table 4-1. Demonstration Cycle Treatment Values

Cycle Treatment	Time (minutes)	Temperature
Pre-wash	1:00	HTW
Wash	5:00	140°F (60°C)
Rinse1	1:30	180°F (82°C)
Rinse 2	1:30	180°F (82°C)
Final Rinse	1:30	180°F (82°C)
Exhaust	1:30	N/A

HWT = Hot Tap Water (130°F [54°C] minimum)

To begin cycle operation:

1. Set **POWER-OFF/STANDBY** Switch, located behind printer door, to **POWER**. Unit name temporarily appears on screen, then display shows first cycle menu:

CYCLE 1 **CYCLE 2**
CYCLE 3 **CYCLE 4**

__Indicates flashing position.

... and printer records:

* CONTROL ON 8:32:31A
 4/21/92



2. Press **CYCLE MENU** touch pad until desired cycle menu appears on screen:

CYCLE 9 **CYCLE 10**
CYCLE 11 **CYCLE 12**

__Indicates flashing position.



- Press **SELECT CYCLE** touch pad until desired cycle name flashes:

CYCLE 9 **CYCLE 10**
CYCLE 11 **CYCLE 12**

___Indicates flashing position.



- When desired cycle name is flashing, press **CYCLE/START** touch pad. Selected cycle name appears on screen and remains displayed for five seconds:

**PRESS START TO
PROCESS - CYCLE 10**



- To start selected cycle, press **CYCLE/START** touch pad, a second time while selected cycle name is displayed on screen.

NOTE: If touch pad is not pressed a second time while selected cycle name is displayed, screen automatically returns to cycle menu.

Once selected cycle is started, printer records:

```
=====
                CYCLE - CYCLE 10
=====
CYCLE START      10:16:20A
CYCLE DATE       4/21/92
CYCLE NUMBER     0000002
UNIT NUMBER      0000000

PHASE           TIME           F
-----
```

- Washer automatically progresses through selected cycle as described in the following section.

NOTE: During cycle, note the following:

- 1) Time displayed on screen counts down time remaining for cycle phase in progress. If Temperature Guarantee feature is selected, time displayed for that phase will only count down when solution/water temperature in chamber sump is equal to or greater than set point.
- 2) Cycle operation may be halted at any time by pressing **STOP/RESET** once. To resume cycle operation at beginning of interrupted phase function (i.e., fill, recirculate, drain), press **CYCLE/START**. To abort cycle operation, press **STOP/RESET** a second time.



WARNING – BURN HAZARD:

- Do not reach into sump.
- Wear appropriate Personal Protective Equipment (PPE) including gloves and face protection, open door slowly and allow chamber and load to cool when cycle is complete. Hot steam may escape through door opening if door is fully opened after cycle is complete.

4.3.1 Pre-Wash (Standard)

1. Hot water, from building supply, fills sump until set water level is attained:

NOTE: Sump may contain rinse water retained from previous cycle.

CYCLE 10 135.7 F
PREWASH FILL 2:00

2. Pre-Wash water recirculates through oscillating jet system for programmed time:

CYCLE 10 139.5 F
PREWASH 1:00

3. Printer records time and water temperature in chamber sump at beginning and end of recirculation:

```
PRE-WASH      10:18:15A   139.5
                10:19:15A   135.0
*****
```



WARNING – BURN HAZARD:
Water discharge may be
extremely hot.

4.3.2 pH Neutralization

1. pH analyzer is initialized:

STANDBY -
NEUTRALIZING SUMP

2. pH analyzer verifies that value is within limits:

CHECKING pH
pH = XX.XXX

3. If pH is too low, while injecting, acid neutralizer is injected to compensate:

pH TOO LOW
INJECTING ACID NEUT.

4. Water-Acid neutralizer solution is mixed:

pH TOO LOW
MIXING WATER

5. If pH is too high, while injecting, alkaline neutralizer is injected to compensate:

pH TOO HIGH
INJECTING ALK. NEUT.

... alternating with:

pH TOO HIGH
MIXING WATER

4.3.3 Alkaline Wash Phase

Hot water from building supply fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature:

CYCLE 10 (G=)137.4 F
ALK. WASH FILL 2:00

If conductivity option is present:

1. Water is heated while recirculating. If temperature is guaranteed actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)141.5 F
RECIRC/HEATING 5:00

2. Alkaline detergent is injected into sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)141.5 F
INJECTING ALK. 5:00

3. Detergent solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)140.0 F
ALKALINE WASH 5:00


4. Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

ALK. WASH10:21:55A 141.5
10:26:55A 140.2

4.3.4 Time-Based pH Neutralization (Option)

Alkaline neutralizer is injected during programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

CYCLE 10 (G=)167.8 F
ALK NEUTRALIZE 2:00

 **WARNING – BURN HAZARD:**
Water discharge may be extremely hot.

4.3.5 Controller-Driven pH Neutralization (Option)

1. pH analyzer is initialized:

**STANDBY
NEUTRALIZING SUMP**

2. pH analyzer verifies that value is within limits programmed:

**CHECKING pH
pH = XX.XXX**

3. If pH is too low, while injecting, acid neutralizer is injected to compensate:

**pH TOO LOW
INJECTING ACID NEUT.**

4. Water-Acid neutralizer solution is mixed:

**pH TOO LOW
MIXING WATER**

5. If pH is too high, while injecting, alkaline neutralizer is injected to compensate:

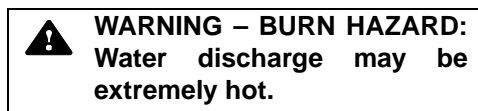
**pH TOO HIGH
INJECTING ALK. NEUT.**

6. Water-Alkaline neutralizer solution is mixed:

**pH TOO HIGH
MIXING WATER**

7. Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

4.3.6 Acid Wash Phase (Option)



Hot water, from building supply fills sump. If temperature is guaranteed, actual sump temperatures alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)137.4 F
ACIDWASH FILL 2:00

- **If conductivity option is present:**

1. Water is heated while recirculating. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)141.5 F
RECIRC/HEATING 5:00

2. Acid detergent is injected into sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)141.5 F
INJECTING ACID 5:00

3. Detergent solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature*.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)140.0 F*
ACID WASH 5:00

4. Printer records time and solution temperature in chamber sump at beginning and end of recirculation:

ACID WASH 10:21:55A141.5
10:26:55A140.2

5. Load is soaked in acid solution for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature:

CYCLE 10 **(G=)167.8 F**
ACID SOAK **2:00**

4.3.7 Time-Based pH Neutralization (Option)

Acid neutralizer is injected during programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

CYCLE 10 **(G=)167.8 F**
ACID NEUTRALIZ **2:00**

4.3.8 Controller-Driven pH Neutralization (Option)

1. pH analyzer is initialized:

STANDBY
NEUTRALIZING SUMP

2. pH analyzer verifies that value is within limits:

CHECKING pH
pH = XX.XXX

3. If pH is too low, while injecting, acid neutralizer is injected to compensate:

pH TOO LOW
INJECTING ACID NEUT.

4. Water-Acid neutralizer solution is mixed:

pH TOO LOW
MIXING WATER

5. If pH is too high, while injecting, alkaline neutralizer is injected to compensate:

pH TOO HIGH
INJECTING ALK. NEUT.

6. Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature:

CYCLE 10 **(G=)128.5 F**
ACID DRAIN **1:00**

4.3.9 Rinse 1 Phase



WARNING – BURN HAZARD:
Water discharge may be
extremely hot.

1. Hot water, from building supply, fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)137.4 F
RINSE 1 FILL 2:00

2. Rinse 1 water is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

Display shows:

CYCLE 10 (G=)140.0 F
RINSE 1 5:00

3. Printer records time and solution temperature in chamber sump at beginning and end of recirculation:

```
RINSE 1    10:21:55A    141.5
              10:26:55A    140.2
*****
```

4.3.10 Controller-Driven pH Neutralization (Option)

1. pH analyzer is initialized:

STANDBY
NEUTRALIZING SUMP

2. pH analyzer verifies that value is within limits:

CHECKING pH
pH = XX.XXX

3. If pH is too low, while injecting, acid neutralizer is injected to compensate:

pH TOO LOW
INJECTING ACID NEUT.

4. Water-Acid neutralizer solution is mixed:

pH TOO LOW
MIXING WATER

5. If pH is too high, while injecting, alkaline neutralizer is injected to compensate:

pH TOO HIGH
INJECTING ALK. NEUT.


6. Water-Alkaline neutralizer solution is mixed:

**pH TOO HIGH
MIXING WATER**

7. Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

**CYCLE 10 (G=)128.5 F
RINSE 1 DRAIN 1:00**

4.3.11 Rinse 2 Phase

 **WARNING – BURN HAZARD:**
Water discharge may be extremely hot.

1. Hot water from building supply fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

**CYCLE 10 (G=)137.4 F
RINSE 2 FILL 2:00**

2. Rinse 2 solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

**CYCLE 10 (G=)140.0 F
RINSE 2 5:00**

3. Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

RINSE 2 10:21:55A 141.5
10:26:55A 140.2

4.3.12 Controller-Driven pH Neutralization (Option)

1. pH analyzer is initialized.

**STANDBY
NEUTRALIZING SUMP**

2. pH analyzer verifies that value is within limits:

**CHECKING pH
pH = XX.XXX**

3. If pH is too low, while injecting, acid neutralizer is injected to compensate:

**pH TOO LOW
INJECTING ACID NEUT.**

4. Water-Acid neutralizer solution is mixed:

**pH TOO LOW
MIXING WATER**

5. If pH is too high, while injecting, alkaline neutralizer is injected to compensate:

**pH TOO HIGH
INJECTING ALK. NEUT.**

6. Water-Alkaline neutralizer solution is mixed.

**pH TOO HIGH
MIXING WATER**

7. Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

**CYCLE 10 (G=)128.5 F
RINSE 2 DRAIN 1:00**

4.3.13 Final Rinse Phase



WARNING – BURN HAZARD:
Water discharge may be
extremely hot.

1. Hot water, from building supply, fills sump. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)137.4 F
F. RINSE FILL 2:00

2. Final Rinse solution is recirculated through oscillating jet system for programmed amount of time. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature.

NOTE: Control alternates between these display screens every four seconds during recirculation. Displayed time will only count down when solution temperature is equal to or greater than set point.

CYCLE 10 (G=)140.0 F
FINAL RINSE 5:00

3. Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

F. RINSE 10:21:55A 141.5
 10:26:55A 140.2

4.3.14 Controller-Driven pH Neutralization (Option)

1. pH analyzer is initialized:

STANDBY
NEUTRALIZING SUMP

2. pH analyzer verifies to see if value is within limits:

CHECKING pH
pH = XX.XXX

3. If pH is too low, while injecting, acid neutralizer is injected to compensate:

pH TOO LOW
INJECTING ACID NEUT.

4. Water-Acid neutralizer solution is mixed:

pH TOO LOW
MIXING WATER

5. If pH is too high, while injecting, alkaline neutralizer is injected to compensate:

pH TOO HIGH
INJECTING ALK. NEUT.

6. Water-Alkaline neutralizer solution is mixed:

**pH TOO HIGH
MIXING WATER**

7. Sump water is pumped to drain. If temperature is guaranteed, actual sump temperature alternates with guaranteed set temperature:

CYCLE 10 **(G=)128.5 F**
F. RINSE DRAIN **1:00**

4.3.15 Exhaust Phase

1. Washer stands idle for programmed time allowing residual vapors to exhaust from wash chamber to room:

CYCLE 10
EXHAUST **1:30**

2. Printer prints time at completion of phase:

EXHAUST 10:38:05A

NOTE: Customer must connect exhaust vent to building exhaust system to prevent directly exhausting vapors to room.

4.3.16 Cycle Complete



! WARNING – BURN HAZARD: Wear appropriate Personal Protective Equipment (PPE) including gloves and face protection, open door slowly, and allow chamber and load to cool when cycle is complete. Hot steam may escape through door opening if door is fully opened after cycle is complete.

! WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or drippage. If spills or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

1. Alarm buzzer sounds and an operator instruction is displayed. Alarm buzzer can be silenced by pressing **ALARM REPLY** touch pad or opening chamber door(s). Instruction remains on screen until door(s) is opened.

**PLEASE OPEN DOOR
AND REMOVE THE LOAD**

... then printer records:

COMPLETE 10:39:35A
MAX WASH TEMP= 141.5F
MAX RINSE TEMP= 180.8F
CYCLE TIME= 0:23:15
=====

2. Cautiously open chamber door to vent remaining steam vapors. Allow chamber to cool a few minutes before removing load. Display screen returns to cycle menu:

CYCLE 9 **CYCLE 10**
CYCLE 11 **CYCLE 12**

___Indicates flashing position.

...and printer records:

DOOR OPENED 10:42:10A

4.4 Stop Cycle Operation



1. Press **STOP/RESET** touch pad to immediately halt operation of cycle in progress. Display screen indicates cycle is/was stopped:

CYCLE 4
CYCLE STOPPED!

... and printer records:

```
RINSE 1      2:54:48P      181.3
* CYCLE STOPPED      2:55:00P
*****
```



2. Press **CYCLE/START** touch pad to resume cycle operation at beginning of interrupted phase function (i.e., fill, recirculate, drain). Phase resets to beginning of interrupted function,

CYCLE 4 **180.5 F**
RINSE 1 **1:30**

... and printer records:

```
RINSE 1      2:55:22P      181.3
*ALARM      2:55:00P
STOP BUTTON PRESSED!
*****
```

4.5 Abort Cycle Operation



1. Press **STOP/RESET** touch pad halt cycle in progress.



2. Press **STOP/RESET** touch pad a second time to abort cycle. Display shows:

CYCLE 4
CYCLE ABORTED!

... and printer records:

```
* CYCLE ABORTED      2:55:00P
*****
```

3. Control automatically returns screen to selected cycle menu:

CYCLE 1 **CYCLE 2**
CYCLE 3 **CYCLE 4**

__Indicates flashing position.

4.6 Shutdown Procedure

At the end of a work session, washer should be shut down and cleaned thoroughly. Refer to *SECTION 6, ROUTINE MAINTENANCE*, for complete cleaning instructions and scheduled minor maintenance.

1. Access Manual Control mode, and drain washer sump.
2. Position **POWER-OFF/STANDBY** switch to **OFF/STANDBY**.
3. Position building electrical disconnect switch (circuit breaker) to **OFF** and close building supply valves.
4. Clean unit as described in *SECTION 6, ROUTINE MAINTENANCE*.
5. Ensure building electrical disconnect switch is positioned to **ON** after completion of cleaning and minor maintenance procedures.

NOTE: Leaving disconnect switch in OFF position overnight will shorten life span of battery backed-up control memory.

4.7 Manual Control Mode

User or service technician can manually control certain washer functions by accessing Manual Control Mode. Manual Control Mode is accessible from Operating Mode when washer is not in cycle.

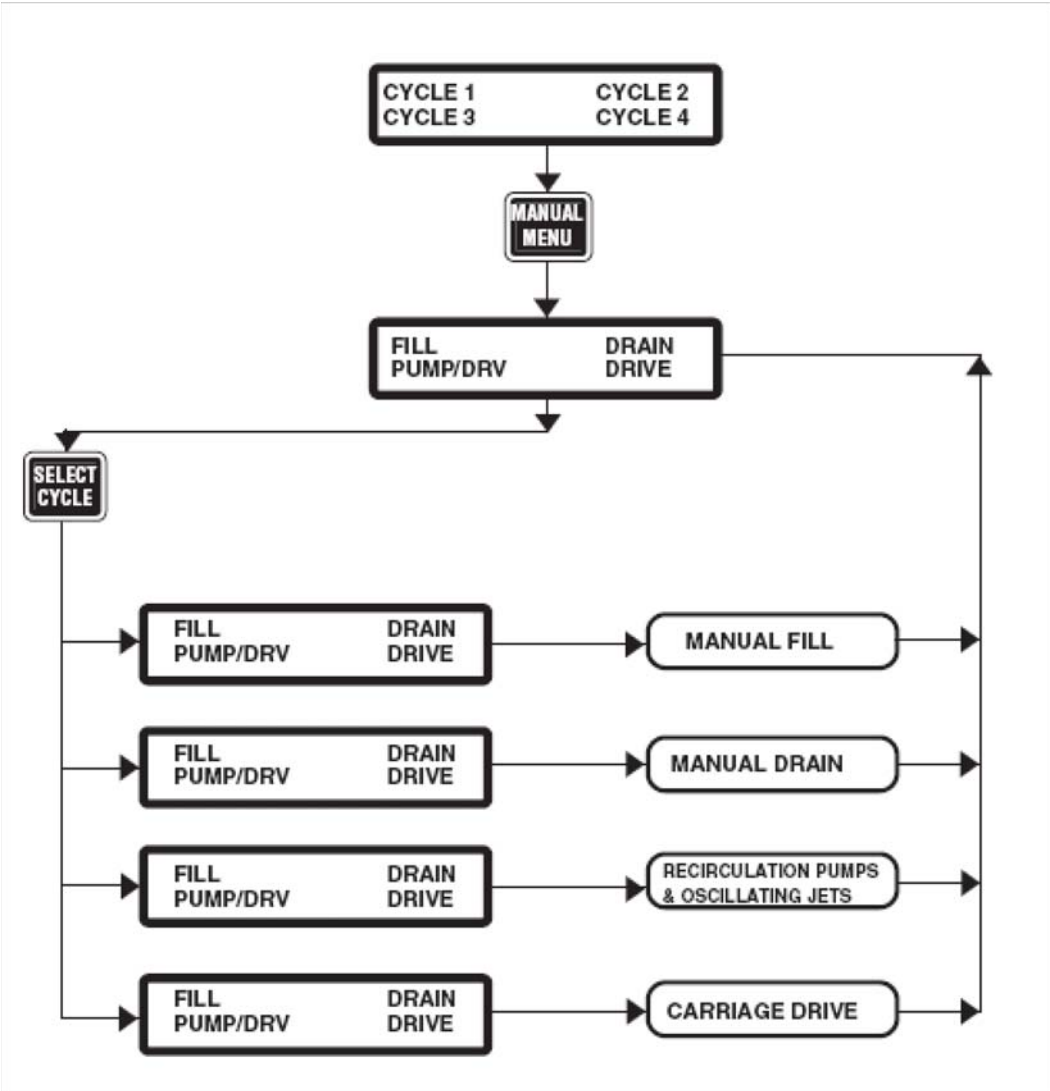


Figure 4-3. Manual Control Mode Flow Chart

4.7.1 Accessing Manual Control Mode



To access Manual Control Mode:

1. From Cycle Menu, press **MANUAL MENU** touch pad:

CYCLE 1	CYCLE 2
CYCLE 3	CYCLE 4

___Indicates flashing position.

2. Display momentarily shows:

MANUAL CONTROL MODE

After 4 seconds, display will show Manual Control Menu:

FILL	DRAIN
PUMP/DRV	DRIVE

___Indicates flashing position.

3. To perform specific manual functions, refer to descriptions included in this section, titled same as shown on display screen. FILL selection allows manual filling of chamber sump. DRAIN selection allows manual draining of chamber sump. PUMP/DRV selection allows manual operation of recirculation pump(s) and oscillating jet system. DRIVE selection allows manual operation of carriage drive system while chamber door is open or closed.

4.7.2 Fill



To access Manual Fill function:

1. At Manual Control Menu, press **SELECT CYCLE** touch pad until FILL is flashing and press **CYCLE/START** touch pad. Display shows:

FILLING SUMP...
PRESS STOP TO ABORT

NOTE: If necessary, manual functions can be aborted at any time by pressing STOP/RESET touch pad.

2. When sump is full, display shows:

SUMP FULL

3. After a delay of 2 seconds, display returns to Manual Control Menu:

FILL	DRAIN
PUMP/DRV	DRIVE

___Indicates flashing position.

4.7.3 Drain



To access Manual Drain functions:

1. From Manual Control Menu, press **SELECT CYCLE** touch pad until DRAIN is flashing. Display shows:

FILL	DRAIN
PUMP/DRV	DRIVE

__Indicates flashing position.

2. To drain sump manually:

If sump is not already full, display shows:

FILLING SUMP...
PRESS STOP TO ABORT

3. Once sump is full, display shows:

SUMP FULL

4. After 3 second delay, jet valve(s) closes, sump drain valve(s) open, and display shows:

DRAINING SUMP...
PRESS STOP TO ABORT

5. Pump will run for DRAIN TIME, then display shows:

SUMP EMPTY

4.7.4 Pump/DRV



To operate recirculation pump(s) and oscillating jet system manually:

1. From Manual Control Menu, press **SELECT CYCLE** touch pad until PUMP/DRV is flashing. Display shows:

FILL	DRAIN
PUMP/DRV	DRIVE

__Indicates flashing position.



2. With PUMP/DRV flashing, press **CYCLE/START** touch pad. If sump is not full, display shows:

FILLING SUMP...
PRESS STOP TO ABORT

3. Once sump is full, display shows:

SUMP IS FULL

4. After a delay of 2 seconds, display shows:

PUMPING/DRIVING...
PRESS STOP TO ABORT

NOTE: Recirculation pump(s) and oscillating jet system will continue to operate until STOP/RESET is pressed.



5. Press **STOP/RESET** touch pad when done. Display returns to Manual Control Menu:

FILL	DRAIN
PUMP/DRV	DRIVE

__Indicates flashing position.

4.7.5 Drive

To operate carriage drive system manually:



1. From Manual Control Menu, press **SELECT CYCLE** touch pad until DRIVE is flashing. Display shows:

FILL **DRAIN**
PUMP/DRV **DRIVE**

—Indicates flashing position.

2. With DRIVE flashing, press **CYCLE/START** touch pad. Display shows:

DRIVING...
PRESS STOP TO ABORT

3. Carriage will oscillate with doors open or closed.

NOTE: Carriage will continue to oscillate until STOP/RESET is pressed.



4. Press **STOP/RESET** touch pad when done. Display returns to Manual Control Menu:

FILL **DRAIN**
PUMP/DRV **DRIVE**



IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.

5.1 Program Touch Pads

Microcomputer control of **Basil® 3500 Cage and Bottle Washer** allows adjustment of previously programmed cycles to process different types of loads. All program changes are made using Program touch pads on washer control panel (see Figure 5-1).



Figure 5-1. Program Touch Pads

Program touch pads function as follows:

- **CHANGE VALUES** - press to access Change Values mode.
- **CURSOR arrows** - (left or right) press until item to be changed (word, letter, or number) flashes.
- **VALUE arrows** - (up or down) depending on item flashing (selected), press to either toggle between answer selections or scroll through alphabet and numbers 0 through 9.

NOTE: Alphabet includes characters for an underline (_) and a space ()

- **SAVE VALUES** - press to save changes made, exit Change Values mode and return screen to cycle menu.

5.2 Change Values Mode

Change Values mode allows authorized operators to change both cycle values and general operating values. In Change Values mode, cycles may be altered and saved as custom cycle programs to meet specific washing needs. See **Table 5-1, CYCLE DESCRIPTION CHART**, for programmable values accessible through Change Values mode.

Table 5-1. Cycle Description Chart

PHASE:	PRE-WASH		ALKALINE WASH		ACID WASH		ACID SOAK		RINSE 1		RINSE 2		FINAL RINSE		EXHAUST	
	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT	RECIRCULATED DEFAULT	SELECT
CIRCULATION (1) TIME:	01:00	00:00 TO 99:99	05:00	00:00 TO 49:99	01:30	00:00 TO 99:99	01:30	00:00 TO 49:99	01:30	00:00 TO 49:99	01:30	00:00 TO 49:99	01:30	00:00 TO 49:99	01:30	00:00 TO 99:99
INJECTION PUMP SELECTION:			ALKALINE DETERGENT PUMP				ACID DETERGENT PUMP									
WATER TYPE OR AIR TEMP	HTW		HEATED 140.0°F (60°C)	HEATED 70.0°F (21.1°C) TO 180°F (82.2°C)	HEATED 180.0°F (82.2°C)	HEATED 70.0°F (21.1°C) TO 180°F (82.2°C)	HEATED 140.0°F (60°C)	HEATED 70.0°F (21.1°C) TO 180°F (82.2°C)	HEATED 180.0°F (82.2°C)	HEATED 70.0°F (21.1°C) TO 180°F (82.2°C)	HEATED 180.0°F (82.2°C)	HEATED 70.0°F (21.1°C) TO 180°F (82.2°C)	HEATED 180.0°F (82.2°C)	HEATED 70.0°F (21.1°C) TO 180°F (82.2°C)		

CYCLE 1	X		X		X		X		X		X		X		X	
CYCLE 2	X		X		X		X		X		X		X		X	
CYCLE 3	X		X		X		X		X		X		X		X	
CYCLE 4	X		X		X		X		X		X		X		X	
CYCLE 5	X		X		X		X		X		X		X		X	
CYCLE 6	X		X		X		X		X		X		X		X	
CYCLE 7	X		X		X		X		X		X		X		X	
CYCLE 8	X		X		X		X		X		X		X		X	
CYCLE 9	X		X		X		X		X		X		X		X	
CYCLE 10	X		X		X		X		X		X		X		X	
CYCLE 11	X		X		X		X		X		X		X		X	
CYCLE 12	X		X		X		X		X		X		X		X	

DEFAULT VALUES NOT SHOWN ON CHART (ADJUSTABLE IN SERVICE MODE ONLY)

X

RECOMMENDED

NOT APPLICABLE

VALUES ADJUSTABLE BY THE OPERATOR IN AUTOMATIC MODE

CTW= COLD TAP WATER

HTW= HOT TAP WATER

RESERVICE IN 100 DAYS

RESERVICE IN 1000 CYCLES

CYCLE COUNT: 00000001 (TYPICAL)

SUMP FILL ALARM TIME:

05:00

00:01-99:99

SUMP DRAIN ALARM TIME:

01:00

00:01-99:99

SUMP HEATING ALARM:

10:00

00:01-45:00

ALKALINE NEUTRALIZER

INJECT:

00:02-99:99

00:05

WAIT:

00:45

00:01-99:99

ACID NEUTRALIZER

INJECT:

00:10

00:02-99:99

WAIT:

00:45

00:01-99:99

DETERGENT MONITORING

03:00

00:01-99:99

PH MONITORING LIMITS

LOW

06 Ph

01:14 Ph

HIGH

09 Ph

01:14 Ph

PH MIXING TIME

00:45

00:01-99:99

PH NUMBER OF TRIES

9

03 TO 15

PH CONTAINMENT INJ TIME

00:02

00:01-00:59

NUMBER OF CHEMICAL PUMPS

3

02 TO 04

COMPLETE CYCLE ALARM TIME

01:00

00:01-99:00

5.3 Programming Cycle Values

1. Set **POWER-OFF/STANDBY** switch, located behind printer door, to **POWER**. Unit name temporarily appears on screen then display shows first cycle menu:

CYCLE 1 **CYCLE 2**
CYCLE 3 **CYCLE 4**

__Indicates flashing position.



2. Press **CYCLE MENU** touch pad until desired cycle menu appears on screen:

CYCLE 9 **CYCLE 10**
CYCLE 11 **CYCLE 12**

__Indicates flashing position.



3. Press **SELECT CYCLE** touch pad until desired cycle name flashes:

CYCLE 9 **CYCLE 10**
CYCLE 11 **CYCLE 12**

__Indicates flashing position.



4. When desired cycle name is flashing, press **CHANGE VALUES** touch pad to access Change Values mode. Printer records:

* CHANGE VALUE 8:44:51A

... and first Change Values screen appears:

CHANGE CYCLE NAME
CYCLE 10

__Indicates flashing position.

NOTE: In Change Values mode, note the following:

- 1) If Access Code feature is enabled and selected cycle is locked out, Access Code sequence will appear after **CHANGE VALUES** is pressed.
- 2) Change Values mode may be exited at any time by pressing **SAVE VALUES**. Control will save changed values and return screen to selected cycle menu.



To change cycle name, press **CURSOR arrows** (right or left) to advance flashing position one space at a time. Press **VALUE arrows** (up or down) to select desired letter, number, punctuation, or space. Cycle name can be a maximum of nine characters including spaces.

NOTE: Pressing **CURSOR arrows** or **VALUE arrows** repeatedly in one direction will cycle through all available positions or letters and numbers.

5.3.1 Pre-Wash - All Units



1. Press **CHANGE VALUES** touch pad. Pre-Wash screen appears:

CYCLE 10 **HTW**
PRE-WASH **T=MM:SS**

__Indicates flashing position.

2. To enter Pre-Wash phase time, press **CURSOR** arrows to select position and **VALUE** arrows to select desired number (0-9). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.

5.3.2 Pre-Wash - All Units, Alkaline Wash



1. Press **CHANGE VALUES**. Alkaline wash phase values screen appears:

CYCLE 10 **SP=140.0 F**
ALK. WASH **T=MM:SS**

__Indicates flashing position.

NOTE: If treatment time is set to 0, treatment is bypassed and question is not displayed.

To enter Wash temperature set point and phase time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0- 9). Temperature set point is input as any number value to 1/10th of a degree, between 70 and 185°F (22 and 85°C). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.

2. Press **CHANGE VALUES** touch pad. Alkaline Wash Temperature Guarantee option screen appears:

GUAR. ALK. WASH TEMP?
NO

__Indicates flashing position.

Press **VALUE arrows** (either up or down) to toggle between YES and NO answer. Selecting NO starts Wash phase time count down at beginning of phase. Selecting YES guarantees that Wash phase time will count down only when solution temperature is equal to, or greater than, programmed set point.

NOTE: With Temperature Guarantee feature enabled, phase time will not count down unless set point is reached. It is important that set point be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).





3. Press **CHANGE VALUES** touch pad. Display shows Conductivity Option screen (if option applies):

SELECT CONCENTRATION

1/4 OZ

__Indicates flashing position.



Press **VALUE arrow** (either up or down) to scroll available concentrations (1/4, 1/2, 1 and 2 oz).



4. Press **CHANGE VALUES** touch pad. Display shows Time-Based Alkaline Detergent screen, if unit is provided with a time-based alkaline detergent setting:

CYCLE 10

ALK. INJ.

T=MM:SS



To enter alkaline detergent injection time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99



5. Press **CHANGE VALUES** touch pad. Display shows Time-Based Alkaline Neutralization Option (if option applies):

CYCLE 10

ALK. NEUT.

T=MM:SS



To enter alkaline neutralizer injection time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99

5.3.3 Wash - Units with Acid Wash Option



1. Press **CHANGE VALUES** touch pad. Acid Wash phase values screen appears:

CYCLE 10 **SP=140.0 F**
ACID WASH **T=MM:SS**

__Indicates flashing position.

NOTE: If treatment time is set to 0, treatment is bypassed and question is not displayed.



To enter Wash temperature set point and phase time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Temperature set point is input as any number value to 1/10th of a degree, between 70 and 185°F (22 and 85°C). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.



2. Press **CHANGE VALUES** touch pad. Wash Temperature Guarantee option screen appears:

GUAR. ACID WASH TEMP?
NO

__Indicates flashing position.

Press **VALUE arrows** (either up or down) to toggle between YES and NO answer. Selecting NO starts Wash phase time count down at beginning of phase. Selecting YES guarantees that Wash phase time will count down only when solution temperature is equal to or greater than programmed set point.

NOTE: With Temperature Guarantee feature enabled, phase time will not count down unless set point is reached. It is important that set point be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).



3. Press **CHANGE VALUES** touch pad. Display shows Conductivity Option screen (if option applies):

SELECT CONCENTRATION
1/4 OZ

__Indicates flashing position.

Press **VALUE arrow** (either up or down) to scroll available concentrations (1/4, 1/2, 1 and 2 oz).



4. Press **CHANGE VALUES** touch pad. Display shows Time-Based Acid Detergent screen, if unit is provided with a time-based acid detergent setting:

CYCLE 10 **T=MM:SS**
ACID INJ.



To enter acid detergent injection time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.

5. Press **CHANGE VALUES** touch pad. Display shows Time-Based Acid Neutralization Option (if option applies):

CYCLE 10
ACID NEUT.

T=MM:SS

To enter acid neutralizer injection time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.

6. Press **CHANGE VALUES** touch pad. Display shows Acid Soak screen:

CYCLE 1
ACID SOAK

T=MM:SS

To enter acid soak time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Injection time is input as minutes and seconds within a range of 0-99 minutes and 0-99 seconds.

5.3.4 Rinse - All Units



1. Press **CHANGE VALUES** touch pad. Rinse 1 phase values screen appears:

CYCLE 10 **SP=180.0 F**
RINSE 1 **T=01M 30S**

__Indicates flashing position.



To enter First Rinse temperature set point and phase time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Temperature set point is input as any number value to 1/10th of a degree. Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds. Temperature is adjustable from 70 to 185°F (22 to 85°C).



2. Press **CHANGE VALUES** touch pad. Rinse 1 Temperature Guarantee option screen appears:

GUAR. RINSE 1 TEMP.
NO

__Indicates flashing position.



Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Selecting NO starts Rinse 1 phase time count down at beginning of phase. Selecting YES guarantees that Rinse 1 phase time will count down only when water temperature is equal to or greater than programmed set point.

***NOTE:** With Temperature Guarantee feature enabled, phase time will not count down unless set point is reached. It is important that set point be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).*



3. Press **CHANGE VALUES** touch pad. Rinse 2 phase values screen appears:

CYCLE 10 **SP=180.0 F**
RINSE 2 **T=MM:SS**

__Indicates flashing position.



To enter Rinse 2 temperature set point and phase time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Temperature set point is input as any number value to 1/10th of a degree. Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds. Temperature is adjustable from 70 to 185°F (22°C to 85°C).



4. Press **CHANGE VALUES** touch pad. Rinse 2 Temperature Guarantee option screen appears:

GUAR. RINSE 2 TEMP.?
NO

__Indicates flashing position.



Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Selecting NO starts Rinse phase 2 time count down at beginning of phase. Selecting YES guarantees that Rinse 2 phase time will count down only when water temperature is equal to or greater than programmed set point.

NOTE: With Temperature Guarantee feature enabled, phase time will not count down unless set point is reached. It is important that set point be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).



5. Press **CHANGE VALUES** touch pad. Final Rinse phase values screen appears:

CYCLE 10 SP=180.0 F
F. RINSE T=MM:SS

__Indicates flashing position.



To enter Final Rinse temperature set point and phase time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Temperature set point is input as any number value to 1/10th of a degree. Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds. Temperature is adjustable from 70 to 185°F (22 to 85°C).



6. Press **CHANGE VALUES** touch pad. Final Rinse Temperature Guarantee option screen appears (only if final rinse is recirculated):

GUAR.F. RINSE TEMP.
NO

__Indicates flashing position.



Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Selecting NO starts Final Rinse phase time count down at beginning of phase. Selecting YES guarantees that Final Rinse phase time will count down only when water temperature is equal to or greater than programmed set point.

NOTE: With Temperature Guarantee feature enabled, phase time will not count down unless set point is reached. It is important that set point be an attainable value. Guaranteed temperature is shown by a G before set point (GSP instead of SP).



7. Press **CHANGE VALUES** touch pad. Display shows:

REUSE F. RINSE WATER?
NO

__Indicates flashing position.

NOTE: This question is not displayed if all three rinses are bypassed. Water is reused, if final rinse is non-recirculated.



Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Selecting YES retains rinse water in sump at

end of Final Rinse phase. Selecting NO pumps rinse water to drain.



8. Press **CHANGE VALUES** touch pad. Exhaust phase values screen appears:

CYCLE 10
EXHAUST **T=MM:SS**

___Indicates flashing position.



To enter Exhaust phase time, press **CURSOR arrows** to select position and **VALUE arrows** to select desired number (0-9). Phase time is input as minutes and seconds within a range of 0-49 minutes and 0-99 seconds.



9. Press **CHANGE VALUES** touch pad. Print Cycle Values option screen appears:

PRINT CYCLE VALUES?
REV=YES **STOP=NO**

NOTE: Display is shown only if printer is enabled.



Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Selecting YES generates a printout of cycle phase values once **SAVE VALUES** or **CHANGE VALUES** is pressed.

10. At this point, operator has option to either continue in Change Values mode or save values and exit Change Values mode.



To continue in Change Values mode, press **CHANGE VALUES** touch pad. Change Operating Values option screen appears:

CHANGE MISCELLANEOUS
VALUES? **NO**

___Indicates flashing position.

NOTE: Refer to next section, Programming Operating Values, for details on continuing in Change Values mode.

5.4 Programming Operating Values

1. Set **POWER-OFF/STANDBY** Switch, located behind printer door, to **POWER**. Unit name temporarily appears on screen then display shows first cycle menu:

CYCLE 1 CYCLE 2
CYCLE 3 CYCLE 4

__Indicates flashing position.



2. Press **CHANGE VALUES** touch pad to access Change Values mode.

NOTE: Access to operating values may be made through any cycle.

First Change Values screen appears:

CHANGE CYCLE NAME
CYCLE 1

__Indicates flashing position.

NOTE: Change Values mode may be exited at any time by pressing SAVE VALUES touch pad. Control will save changed values and return screen to selected cycle menu.



3. Press **CHANGE VALUES** touch pad several times to advance through phase values screens until Change Operating Values option screen appears:

CHANGE MISCELLANEOUS
VALUES? NO

__Indicates flashing position.

Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Select YES to continue in Change Values mode.

NOTE: If NO is selected, pressing CHANGE VALUES or SAVE VALUES returns display screen to cycle menu.



4. Press **CHANGE VALUES** touch pad. Printer enabling screen appears:

PRINTER ENABLED?
NO

__Indicates flashing position.

Press **VALUE arrow** (either up or down) to toggle between YES and NO answer. Select YES to enable printer, NO to disable it.



5. Press **CHANGE VALUES** touch pad. Date and Time screen appears:

DATE MM/DD/YY
TIME HH:MM:SSA

__Indicates flashing position.

To enter correct date and time, press **CURSOR arrows** (right or left) to advance flashing position one space at a time. Press **VALUE arrows** (up or down) to select desired number (0-9).



Date is input as two-digit numerical values for Month/Day/Year.
Time is input as Hour/Minute/Second.

NOTE: When changing date and time, note the following:

- 1) *Pressing CURSOR arrows or VALUE arrows repeatedly in one direction will cycle through all available positions or letters and numbers.*
- 2) *If Access Code feature is enabled and selected cycle is not locked out, Access Code sequence will appear after Date and Time screen.*



6. Press **SAVE VALUES** touch pad to save miscellaneous values, exit Change Values mode, and return screen to cycle menu.

NOTE: At this point, pressing CHANGE VALUES touch pad will also save all changed operating values, exit Change Values mode, and return screen to cycle menu.

5.5 Programming Values with Access Code Enabled



1. When desired cycle name is flashing, press **CHANGE VALUES** touch pad to access Change Values mode. Printer records:

* CHANGE VALUE3:51:17P

and, if selected cycle is locked out, following screen appears:

**DO YOU KNOW ACCESS
CODE? NO**

__Indicates flashing position.



Press **VALUE arrows** (either up or down) to toggle between YES and NO answer. If NO is selected, screen returns to cycle menu once **CHANGE VALUES** touch pad is pressed.



2. Press **CHANGE VALUES** touch pad. If YES was selected, following screen appears:

**ENTER ACCESS CODE.
CODE=0000**

__Indicates flashing position.



To enter access code, press **CURSOR arrows** (right or left) to advance flashing position one space at a time. Press **VALUE arrows** (up or down) to select desired number (0-9). If an incorrect access code is entered, screen returns to cycle menu once **CHANGE VALUES** touch pad is pressed.

NOTE: Pressing CURSOR arrows or VALUE arrows repeatedly in one direction will cycle through all available positions or letters and numbers.



- Press **CHANGE VALUES**. First Change Values screen appears:

**CHANGE CYCLE NAME
CYCLE 1**

__Indicates flashing position.

At this point, operator has access to all phase values screens of selected cycle and operating values screens. Sequence and procedures for changing cycle phase and operating values are same as previously discussed.

NOTE: If Access Code feature is enabled and selected cycle is not locked out, only operating values will be protected by access code. Access code screen sequence will occur after Date and Time screen. After entering correct access code, operator has access to remaining operating values screens.

5.6 Review and Print Specific Cycle Program



- Press **CYCLE MENU** touch pad until desired cycle menu appears on screen.

**CYCLE 5 CYCLE 6
CYCLE 7 CYCLE 8**

__Indicates flashing position.



- Press **SELECT CYCLE** touch pad until desired cycle name flashes.

**CYCLE 5 CYCLE 6
CYCLE 7 CYCLE 8**

__Indicates flashing position.



- Press **REVIEW CYCLE** touch pad to access Cycle Review mode, and review first phase of selected cycle.

**CYCLE 6 HTW
PREWASH T=01:00**



- Continue to press **REVIEW CYCLE** touch pad to sequentially review each phase of selected cycle.

**CYCLE 6 SP=180.0F
FINAL RINSE T=01:00**



- Press **REVIEW CYCLE** touch pad until print message appears on screen.

**PRINT CYCLE VALUES?
REVIEW = YES STOP = NO**



- To generate a printout of reviewed cycle phases and values, press **REVIEW CYCLE** touch pad. Display screen returns to first phase of selected cycle:

CYCLE 6 **HTW**
PREWASH **T=01:00**

and printer records:

```
=====
CYCLE PROGRAM REVIEW
= CYCLE - CYCLE 6 =
=====

REVIEW TIME      5:18:25P
REVIEW DATE      4/24/92
UNIT NUMBER      3600000000

PHASE      TIME      F
-----
PRE-WASH   1:00      HTW
DET-WASH   5:00      140.0
RINSE 1    1:30      180.0
RINSE 2    1:30      180.0
F. RINSE   1:30      180.0G
EXHAUST    1:30      ----
-----
```

*NOTE: At this point, user may either initiate selected cycle or exit Cycle Review mode. To initiate selected cycle, press **CYCLE/START** twice. To exit Cycle Review mode, press **CYCLE MENU** touch pad. Control will exit mode and return display screen to selected cycle menu.*



- To by-pass printout option, press **STOP/RESET** touch pad. Control exits Cycle Review mode and display screen returns to selected cycle menu.

CYCLE 5 **CYCLE 6**
CYCLE 7 **CYCLE 8**

___Indicates flashing position.

5.7 Extend Cycle Phase Time

Cycle phase times may be temporarily extended by pressing **EXTEND CYCLE** touch pad either while cycle is in progress or prior to initiating cycle during cycle program review. Temporarily extended phase times apply only to immediate cycle selected. On completion of cycle, phase times return to programmed set points.

5.7.1 During a Cycle

- After starting a cycle, programmed time for each phase may be temporarily extended only when particular phase process is in operation.

CYCLE 6 **182.7 F**
RINSE **11:30**



2. To extend phase time, press **EXTEND CYCLE** while actual phase process (i.e., recirculating, exhausting) is in operation. Each time touch pad is pressed, programmed time set point is added to phase time remaining.

CYCLE 6	182.4 F
RINSE 1	2:00

Printer records:

RINSE 1	4:09:49P	182.6
	4:14:49P	182.5
RINSE 2	4:16:54P	182.7
RINSE 2	PHASE EXT.	
	4:19:15P	182.4
F. RINSE	4:21:25P	182.6

*NOTE: Filling and draining functions are not effected by extend phase feature. If **EXTEND CYCLE** touch pad is pressed during these functions, cycle continues as programmed.*

5.7.2 Prior to Starting a Cycle



1. Once cycle is selected, press **REVIEW CYCLE** touch pad to access Cycle Review mode. Continue to press **REVIEW CYCLE** to advance screen to desired phase.

CYCLE 6 **SP=180.0F**
RINSE 1 **T=1:30**



2. With correct cycle phase displayed, press **EXTEND CYCLE** touch pad. Programmed phase time is temporarily doubled. If **EXTEND CYCLE** is pressed again, phase time returns to original programmed time set point.

CYCLE 6 **SP=180.0F**
RINSE 1 **ET=3:00**

NOTE: While in Cycle Review mode, EXTEND CYCLE touch pad only allows operator to double programmed phase time. If a longer phase time is desired, programmed time set point must either be manually extended during cycle or adjusted in Change Values mode prior to starting cycle.



3. Press **REVIEW CYCLE** touch pad until print message appears on screen.

PRINT CYCLE VALUES?
REVIEW = YES STOP = NO

NOTE: To run cycle with extended phase times, cycle must be started while in Cycle Review mode. To remain in Cycle Review mode, operator must answer YES to print message by pressing REVIEW CYCLE touch pad. If operator answers NO by pressing Stop/Reset, control exits Cycle Review mode, display screen returns to cycle menu, and any adjustments made while in Cycle Review mode are erased.



4. Press **REVIEW CYCLE** touch pad to generate a printout of reviewed cycle values and return display screen to first phase of selected cycle. An "X" will be printed next to each extended phase time.

```
=====
CYCLE PROGRAM REVIEW
= CYCLE - CYCLE 6 =
=====

REVIEW TIME      5:18:25P
REVIEW DATE      4/24/92
UNIT NUMBER      0000000

PHASE      TIME      F
-----
PRE-WASH   1:00      HTW
DET-WASH   5:00      140.0
RINSE 1 E  3:00      180.0
RINSE 2     1:30      180.0
F. RINSE    1:30      180.0G
EXHAUST     1:30      ----
-----
```



WARNING—BURN HAZARD: Wear appropriate Personal Protective Equipment (PPE) including gloves and face protection, open door slowly, and allow chamber and load to cool when cycle is complete. Hot steam may escape through door opening if door is fully opened after cycle is complete.

5.8 By-Pass Cycle Phase



WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or drippage. If spills or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

- Press **CYCLE/START** touch pad twice to initiate cycle. Cycle automatically progresses through each phase as temporarily adjusted in Cycle Review mode.

NOTE: Cycle may be started at any point in Cycle Review mode.

- On completion of cycle, alarm buzzer sounds and an operator instruction is displayed.
- When door(s) is opened, display screen returns to first cycle menu, control exits Cycle Review mode, and phase times return to programmed time set points.

A cycle phase may be by-passed only if Temperature Guarantee is not selected and cycle in progress is not locked out by an access code. Access code prevents unauthorized by-passing of phases and/or changing cycle phase values. Refer to *SECTION 5.5, PROGRAMMING VALUES WITH ACCESS CODE ENABLED*, for details on access code feature.

If Temperature Guarantee is not selected and cycle is not programmed with an access code, cycle phase may be by-passed only while particular phase process is in operation. By-passed phases apply only to immediate cycle in progress.

- To by-pass a phase, press **BY-PASS PHASE** touch pad while actual phase process (i.e., recirculating, exhausting) is in operation.

CYCLE 8 181.3 F
PREWASH 1:00

- Control aborts phase process in operation and automatically continues with next programmed phase.

CYCLE 8 154.6 F
PREWASH DRAIN 1:00

Printer records:

PHASE	TIME	F
PRE-WASH	2:44:08P	181.3
PRE-WASH PHASE		BYP
DET-WASH	2:46:53P	181.4
	2:51:53P	181.1
RINSE 1	2:54:48P	181.3

NOTE: Filling and draining functions can not be by-passed. If BY-PASS PHASE is pressed during these functions, control automatically resets timer and begins filling/draining function again.



IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.



WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

- Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.
- Only STERIS or STERIS-trained service personnel should make repairs or adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel, or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding service options.



WARNING – BURN HAZARD: Before performing any service on unit, wait until chamber and piping cool to room temperature.

Procedures described in this section must be performed at regular intervals indicated. Indicated frequencies are minimums and should be increased with increased use of equipment. If a problem occurs, refer to SECTION 7, TROUBLESHOOTING. A sample preventive maintenance schedule is included in this section. Use sample schedule as a guide to establish a facility preventive maintenance record for your washer.

Close attention should be paid to conditions in operating environment which will affect frequency of some maintenance procedures indicated (e.g., mineral content of water supply, washer usage).

6.1 Preventive Maintenance Schedule

The following guide should be used to properly maintain washer. These procedures should be carried out only by qualified service technicians. Certain procedures need to be completed by STERIS, noted by a star (*), contact STERIS when service is required. Preventive maintenance is not covered under warranty.

Table 6-1. Preventive Maintenance Guide

Recommended frequency of inspection is monthly. Usage and utility conditions may require more or less inspections. Tasks are defined on a yearly basis.		Frequency
1.0 PREPARATION FOR PREVENTIVE MAINTENANCE		
1.1	Discuss equipment with department personnel.	12 x/yr
1.2	Inspect printouts for signs of trouble.	12 x/yr
1.3	If required, install test equipment.	12 x/yr
1.4	When necessary, shut off all building services and drain all lines.	12 x/yr
2.0 MICROCOMPUTER CONTROL		
2.1	Inspect printer for proper operation.	6 x/yr
2.2	inspect touch panel(s) for proper operation. Check all touch pads.	6 x/yr
2.3	Verify proper date and time are displayed; if not, reset.	6 x/yr
2.4	Verify paper takeup is working properly.	6 x/yr
2.5	Check printout for darkness, missing dots, etc.	3 x/yr
3.0 DOOR ASSEMBLIES		
3.1	Observe door(s) for ease of operation.	12 x/yr
3.2	Inspect condition for door gasket for wear - Replace if necessary.*	12 x/yr
3.3	Verify operation of door safety switch(es) - Adjust if necessary.*	4 x/yr
4.0 CHAMBER COMPONENTS		
4.1	Verify vortex plate for debris - Clean if necessary.	12 x/yr
4.2	Inspect water level float ball - Clean as necessary.	12 x/yr
4.3	Verify proper water level in sump (verify after filling function).*	6 x/yr
4.4	Remove hard water deposits from sump and chamber interior.	6 x/yr
4.5	Verify piping for leaks - Repair if necessary.*	12 x/yr
4.6	If applicable, inspect condition of washer accessories.	12 x/yr
5.0 OSCILLATING JET SYSTEM		
5.1	Inspect spray jets - Align and clean as necessary.	12 x/yr
5.2	Inspect spray header - Flush out as necessary.	12 x/yr

Table 6-1. Preventive Maintenance Guide (Cont'd)

Recommended frequency of inspection is monthly. Usage and utility conditions may require more or less inspections. Tasks are defined on a yearly basis.		Frequency
5.3	Inspect oscillating header drive and clutch system. Test clutch for slippage - Adjust if necessary.*	12 x/yr
5.4	Verify header rollers for wear - Replace if necessary.*	12 x/yr
6.0 EACH SUPPLY-LINE STRAINER		
6.1	Inspect strainer for debris - Clean as necessary.	4 x/yr
7.0 EACH STEAM TRAP		
7.1	Inspect steam trap for proper operation.*	12 x/yr
7.2	Rebuild steam trap as required.*	A/R
8.0 EACH VALVE		
8.1	Inspect each valve - Clean if necessary.	4 x/yr
8.2	Inspect each solenoid valve for proper operation -Replace if necessary.*	4 x/yr
8.3	Rebuild each solenoid valve based on history unit failure.*	2 x/yr
8.4	Inspect valves -Clean or replace if necessary.	4 x/yr
9.0 PUMP MOTOR		
9.1	Inspect pump seal for leakage - Replace if necessary.*	6 x/yr
9.2	Verify for proper pump rotation.*	12 x/yr
9.3	Verify for noise and vibration.*	12 x/yr
9.4	grease pump motor bearings where applicable.	2 x/yr
10.0 SELF CLEANNING SCREEN		
10.1	Inspect self-cleaning screen - Disassemble and remove debris from screen as necessary.	12 x/yr
11.0 MICROCOMPUTER CONTROL SYSTEM		
11.1	Calibrate temperature set points.*	4 x/yr
11.2	Replace battery backed RAM chip as required.*	A/R
11.3	Replace printer as required.*	A/R
12.0 ELECTRICAL CONTROL BOX		
12.1	Verify all sockets for proper seating of electrical components.*	12 x/yr
12.2	Inspect wiring, terminals, and socket connections for damage or fraying.*	12 x/yr
13.0 FINAL TEST		
13.1	Clean lint and dirt from components.	12 x/yr
13.2	Run unit through two cycles to verify proper operation -Verify all displays and printouts.	12 x/yr

Table 6-1. Preventive Maintenance Guide (Cont'd)

Recommended frequency of inspection is monthly. Usage and utility conditions may require more or less inspections. Tasks are defined on a yearly basis.	Frequency
13.3 Remove all test equipment installed for inspection.	12 x/yr
13.4 Install any panel or cover removed during inspection.	12 x/yr
13.5 Inspect work area and washer to ensure removal of all materials used during inspection	12 x/yr

6.2 Daily Maintenance

6.2.1 Inspect Vortex Plate



WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to "OFF" before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.



WARNING – BURN HAZARD: Before performing any service on unit, wait until chamber and piping cool to room temperature.

1. Remove load grating from bottom of wash chamber.
2. Inspect and remove any debris located under and around vortex plate (see Figure 6-1).
3. Replace load grating in chamber.

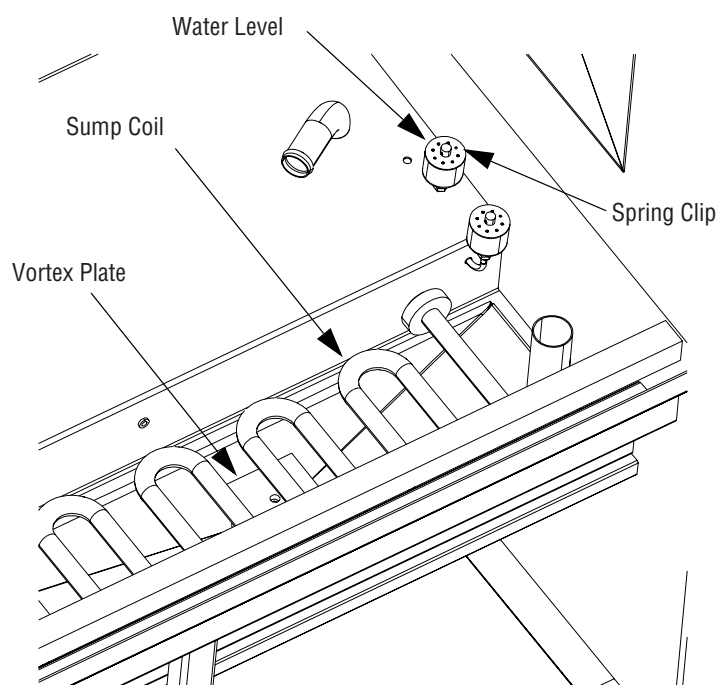


Figure 6-1. Vortex Plate and Water Level

6.2.2 Clean Water Level

1. Locate water level in bottom of sump and remove spring clip holding water level in place (see Figure 6-1).
2. Lift water level from shaft.
3. Clean any debris from shaft and inside water level using an appropriately sized nylon brush.
4. Replace water level in correct position and insert spring clip.

6.3 Weekly Maintenance

6.3.1 Clean Washer Exterior

Clean washer exterior with a general purpose cleaner to remove general stains, a stainless-steel stain remover to remove stubborn stains, and a stainless-steel polish to keep equipment looking new.

1. Using a damp cloth or sponge, apply cleaner in a back and forth motion, in the same direction as surface grain.
2. Thoroughly wipe off cleaner.
3. Polish surface with a clean, dry and lint-free cloth.



WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to "OFF" before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.



CAUTION – POSSIBLE EQUIPMENT DAMAGE: Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in the same direction as the surface grain). Cleaners rubbed in a circular motion or applied with a wire brush or steel wool will damage stainless steel. Do not use these cleaners on painted surfaces.

6.3.2 Clean Washer Interior



CAUTION – POSSIBLE EQUIPMENT DAMAGE: Never use rinse-dry chamber as a sink. Under no circumstances should waste water be poured into it as water could overflow drain and damage delicate components.

1. Wash chamber with a mild detergent solution.
2. Rinse with tap water and dry with a lint-free cloth.
3. If interior is stained, use a general purpose cleaner to remove general stains or a stainless-steel stain remover for stubborn stains, as follows:
 - a. Using a damp cloth or sponge, apply cleaner in a back and forth motion, in same direction as surface grain.
 - b. Thoroughly wipe off cleaner.
 - c. Polish surface with a clean, dry and lint-free cloth.

6.3.3 Clean Spray Jets and Header

1. During unit operation inspect each nozzle to detect debris.
2. Insert a wire (smaller diameter than jet orifice) into jet nozzles and push debris through nozzles into header.

NOTE: Jet nozzles are factory aligned to provide maximum washing efficiency. Do not move spray jets when cleaning.

3. Remove flush plugs from bottom of spray headers (see Figure 6-2).
4. Manually fill sump with water and run pump for 30 seconds to flush loosened debris from spray headers.
5. Replace flush plugs.

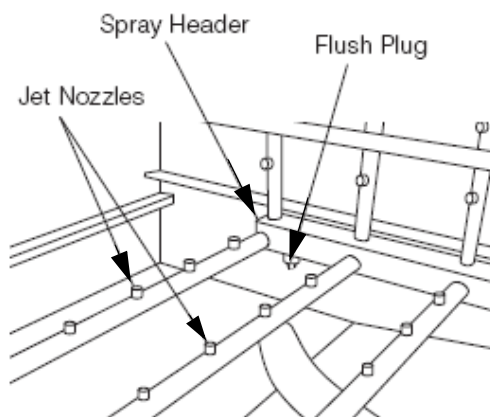


Figure 6-2. Spray Header

6.4 Monthly Maintenance

6.4.1 Inspect Self-Cleaning Filter



WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to **OFF** before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.



WARNING – BURN HAZARD: Before performing any service on unit, wait until chamber and piping cool to room temperature.

1. Set **POWER-OFF/STANDBY** switch to **OFF/STANDBY**. Lock disconnect switch in **OFF** position and close building supply valves.
 2. Remove quick-disconnect clamp directly above pump (see Figure 6-3).
 3. Move plate to one side and remove Teflon¹ gasket.
 4. Remove self-cleaning filter cartridge by pulling out by handle.
 5. Rinse filter cartridge to remove any debris and inspect for damage.
 6. Carefully reinsert cartridge in assembly housing and replace gasket. Reposition plate over gasket and evenly tighten quick-disconnect clamp.
- NOTE: Gasket should last for several inspection procedures. When necessary, order replacement gasket (P764324-398) from STERIS*
7. Re-energize washer utilities.

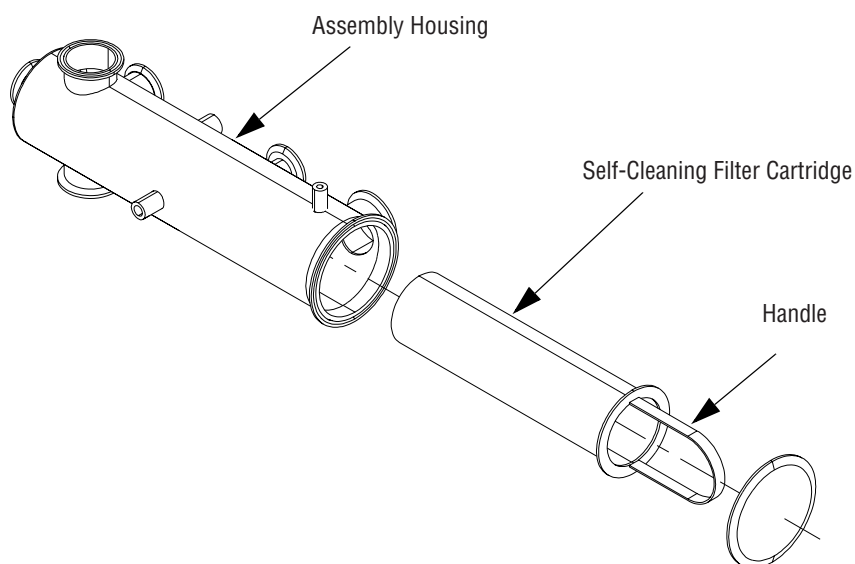


Figure 6-3. Self-Cleaning Filter

¹ Teflon is a registered trademark of DuPont.

6.4.2 Remove Hard Water Deposits from Chamber and Accessories

NOTE: Depending on hardness of water being used, it may be necessary to remove hard water deposits more often. Remove deposits from chamber and material handling accessories whenever deposits become visible.

1. If desired, place empty accessory rack in chamber.
2. Turn off detergent supply pump (not supplied by STERIS).
3. Pour one quart of a descaling liquid into chamber sump and close door.
4. Press **MANUAL MENU** to access Manual Control mode.
5. Select and start Pump/Drive function.
6. Let washer run for 15 minutes, then press **STOP/RESET**.
7. Once hard water deposits are removed, select and start Drain function to drain descaler solution from sump.
8. Manually fill and drain chamber sump again to remove any residue.
9. Press **STOP/RESET** to exit Manual Control mode and turn on detergent supply pump.

6.5 Quarterly Maintenance

6.5.1 Clean Building Supply-Line Strainers



WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to **OFF** before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.



WARNING – BURN HAZARD:

- Before performing any service on unit, wait until chamber and piping cool to room temperature.
- Pipes may be extremely hot.

1. Set **POWER-OFF/STANDBY** switch to **OFF/STANDBY**. Lock disconnect switch in **OFF** position and close building supply valves.
2. Remove hex caps from each strainer body.
3. Pull out strainer screen from body.
4. Using a wire brush or steel wool, scrape all rust and residue from strainer screen and body. Ensure all perforations are clear by poking open with a wire. Replace screen if damaged or corroded.
5. Verify no dirt or other particles remain in strainer body and insert screen into strainer body.
6. Using pipe joint sealing compound, replace and tighten hex cap.
7. Verify all pipe connections are tight and leak free after reassembly.
8. Re-energize washer utilities.

6.5.2 Replace Detergent Squeeze Tube



WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to OFF before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.



WARNING – BURN HAZARD: Before performing any service on unit, wait until chamber and piping cool to room temperature.



WARNING – CHEMICAL BURN HAZARD: Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.

1. Set **POWER-OFF/STANDBY** switch to **STANDBY**. Lock disconnect switch in OFF position and close building supply valves.

2. Open detergent pump compartment door.

NOTE: Replace squeeze tubes one by one to avoid messing chemicals.

3. Remove clamps and disconnect supply and injection hoses from squeeze tube (see Figure 6-4).

4. Remove screws from pump cover and lift off pump cover.

5. Grasp one end of squeeze tube and pull tube out of pump. Discard tube.

6. Clean all pump surfaces.

7. Lubricate new squeeze tube (P117950-583). Liberally apply lubricant (P117950-599) over tube surface to within two inches of each end.

8. Insert one end of squeeze tube into pump. Feed tube through pump by manually rotating roller block.

IMPORTANT: Do not insert pickup tube into container without verifying its for the proper application.

9. Spread lubricant over rollers in roller block.

10. Replace pump cover and fasten with screws previously removed.

11. Connect supply and injection hoses to ends of squeeze tube and attach clamps.

12. Re-energize washer utilities.

Pump Cover

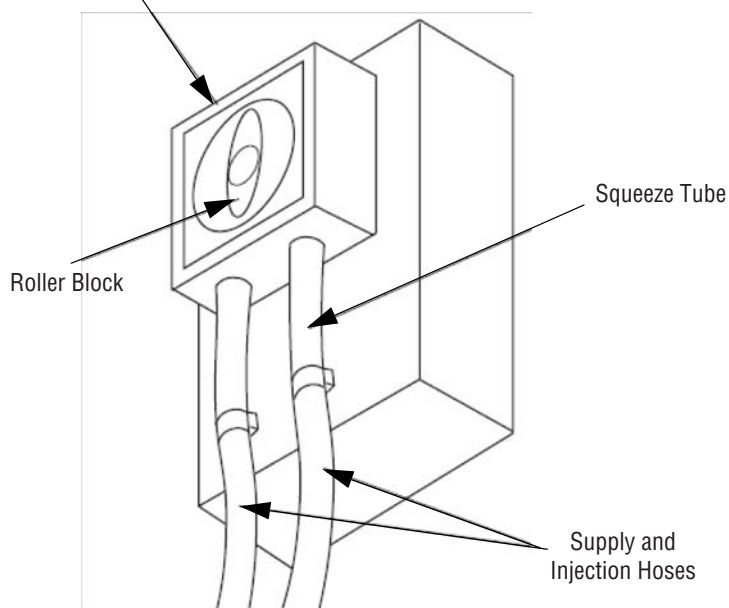


Figure 6-4. Detergent Supply Pump

6.5.3 Clean Water Inlet Strainer

Strainer, located in the incoming water line to vapor condenser, must be cleaned once every three months.

1. Set **POWER-OFF/STANDBY** switch to **STANDBY**. Lock disconnect switch in OFF position and close building supply valves.
2. Pull out strainer screen from body.
3. Using a wire brush or steel wool, scrape all rust and residue from strainer screen and body. Ensure all perforations are clear, by poking open with a wire. Replace screen if damaged or corroded.
4. Verify no dirt or other particles remain in strainer body. Insert screen into strainer body.
5. Using pipe joint sealing compound, replace and tighten hex cap.
6. Verify all pipe connections are tight and leak free after reassembly.
7. Re-energize washer utilities.

6.6 Yearly Maintenance

6.6.1 Heat Exchanger Control Adjustments

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Only **STERIS** or **STERIS-trained service personnel** should make repairs or adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel, or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact **STERIS** regarding service options.

WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to **OFF** before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.

WARNING – BURN HAZARD: Pipes may be extremely hot.

Washer is equipped with a steam heat exchanger and valving system to preheat fill water.

Fill water temperature can be controlled by adjusting throttling valves which regulate flow of steam and hot water through heat exchanger.

1. Completely close steam throttling valve and fully open building hot water supply throttling valve (see Figure 6-5).
2. Drain chamber sump by selecting function from Manual Menu and pressing **CYCLE/START** touch pad.
3. After display screen indicates that sump is empty, select **FILL** function from Manual Menu and press **CYCLE /START**.
4. Verify reading on heat exchanger temperature gauge. Gauge indicates temperature of fill water after water passes through heat exchanger.
5. Slowly open steam throttling valve until temperature gauge reads desired temperature.

NOTE: Recommended fill water temperature is 180 to 190°F (82 to 88°C).

6. If gauge does not reach desired temperature after steam throttling valve is fully open, slowly close building hot water supply throttling valve until desired temperature is reached.

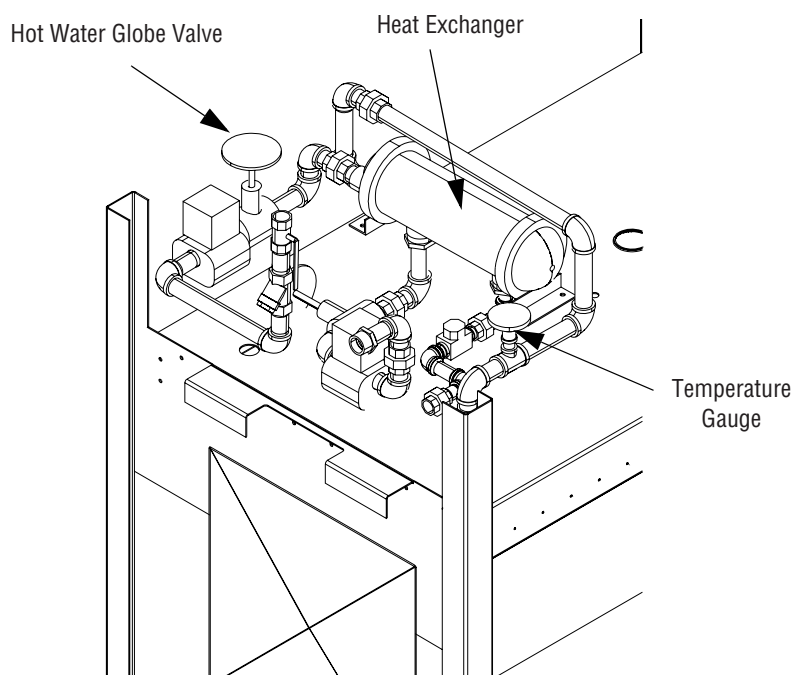


Figure 6-5. Heat Exchanger Temperature Controls

6.7 As Necessary

6.7.1 Replace Detergent Container



WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to OFF before performing any preventive maintenance functions within the compartments. Electrical shock can cause serious injury.






WARNING – CHEMICAL BURN HAZARD: Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.

1. Lift supply hose and low level sensor out of detergent container.
2. Replace detergent container.
3. Insert supply hose and low level sensor into new detergent container.

6.7.2 Change Printer Paper

See Figure 6-6.

NOTE: Do not operate printer without paper.

	WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.
	WARNING – BURN HAZARD: Before performing any service on unit, wait until chamber and piping cool to room temperature.
	WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to OFF before performing any preventive maintenance functions within the compartments. Electrical shock can cause serious injury.

1. Set **POWER-OFF/STANDBY** switch to **OFF/STANDBY**. Lock disconnect switch in OFF position and close building supply valves.
2. Open printer door. Pull remaining paper (in an upward motion) through printer.
3. Remove take-up spindle from its drive mechanism by pulling to left.
4. Remove paper roll from take-up spindle and set empty take-up spindle aside.
5. Lower platen and remove lower paper spindle by pulling it straight forward.
6. Place new paper roll onto lower spindle with paper feeding downward from back of paper roll.
NOTE: Verify paper roll is positioned correctly. Thermal paper will not print if paper is inserted backwards. Use only STERIS thermal paper (P129359-008) Damage to printer mechanism can occur if paper of different width or thickness is used.
7. Replace lower spindle (with new paper roll) back into position by pressing from front until it snaps into place.
8. Pull 4 or 5" (10 or 13 cm) of paper out from roll and tear corners off to form a **V**.
9. Slide tab of paper roll into printer from back (with platen still in down position) until it exits from front of printer.
10. Grab tab of paper, pull up 10 to 12" (25 to 30 cm) of paper, in an upward motion to protect print head, and feed this paper through opening in platen.
11. Insert tab of new paper roll into slot of take-up spindle and rotate spindle to secure paper in slot.
12. Raise platen back up into position and snap in place under catch.
13. Insert tab of new paper roll into slot of take-up spindle and rotate spindle in direction shown to secure paper in slot.
14. Press take-up spindle back onto drive mechanism and allow motor to rotate spindle to verify paper is secured to take-up roll.
15. Set **POWER/OFF-STANDBY** switch to **OFF-STANDBY** position; then to **POWER** to verify paper is correctly routed into mechanism and printer prints. Printer will not print if thermal paper was placed on wrong side.
16. Close printer door and re-energize washer utilities.

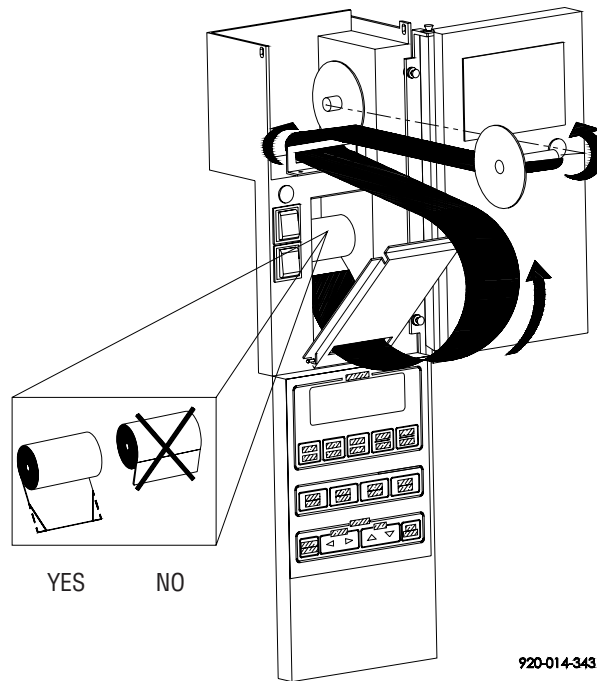


Figure 6-6. Changing Printer Paper Roll

6.7.3 Store Thermal Paper

Thermal paper is subject to fading with time, humidity and exposure to light.

It is manufacturer's recommendation that thermal paper be stored in a dark place with an average ambient temperature of less than 77°F (25°C) and a relative humidity less than 65%. Under these conditions, paper remains readable for at least five years. It is recommended that if the printed data is to be retained for periods of time longer than five years (6-25 years), an additional photocopy should be made for record retention. In any case, a duplicate set of records should be maintained in files of engineering or maintenance departments.

Thermal paper begins to develop color at about 158°F (70°C), however, under humid conditions, it might begin to develop at an accelerated rate. If stored for 24 hours at 140°F (60°C), paper will show some signs of development. It will also show signs of development if stored for 24 hours at 113°F (45°C) and a relative humidity of 90%.

Do not store thermal paper next to other chemically treated papers - such as pressure sensitive paper or other type of recording round charts - as this may cause fading in print. If thermal paper is to be stored in same area, always ensure it and other chemically treated papers are kept in separate envelopes.

Thermal paper discolors when exposed to direct sunlight.

IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel, or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRIC SHOCK HAZARD: Always set building electrical-supply disconnect switch and console master power switch to OFF before performing any preventive maintenance functions within the compartments. Electrical shock can cause serious injury.

WARNING – BURN HAZARD: Before performing any service on unit, wait until chamber and piping cool to room temperature.

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

- Repeated fuse burnouts indicate a short circuit or overload. Trouble should be located and corrected by a fully trained technician.
- Failure to connect wires to proper terminals may result in damage to, or malfunctioning of, unit when power is applied.

This section contains detailed information on types of washer malfunctions likely to occur, and possible causes and corrective actions.

If you are unable to correct the problem with use of the following Troubleshooting Charts, or if a problem occurs that is not described on chart, please call STERIS. A factory-trained technician will promptly place your washer in proper working condition. Service charges may be incurred. Consult your warranty for details.

NOTE: Never allow unqualified persons to service washer.

Table Descriptions

Table 7-1 - Problems where NO alarm or printout occur.

Table 7-2 - Problems where alarm and/or printout occur.

Table 7-1. Operator Troubleshooting Chart - No Alarm or Printout

PROBLEM	POSSIBLE CAUSE AND CORRECTION
1. No power, screen is blank.	<ol style="list-style-type: none"> 1. Building electrical supply disconnect switch (circuit breaker) is in OFF position - Position switch to ON. 2. Fuse in power supply failed - Replace fuse. 3. Power supply failed - Replace power supply. 4. Control board failed - Replace control board.
2. Unable to select cycle.	<ol style="list-style-type: none"> 1. Washer in Standby mode - Set POWER-OFF STANDBY switch to POWER. 2. Printer still printing - Wait until printout completes. 3. Faulty touch pad - Replace. 4. Faulty door safety switch - Replace safety switch.
3. Cycle does not start when CYCLE/START touch pad is pressed twice.	<ol style="list-style-type: none"> 1. Chamber door(s) open - Close door(s) 2. Hot water supply valve closed - Open building and washer supply valves. 3. Faulty door safety switch - Replace safety switch. 4. Faulty touch pad - Replace.
4. Too much water entering chamber. Water overflowing from drip gutter.	<ol style="list-style-type: none"> 1. Water level float ball malfunctions - Verify operation of float ball. Clean or replace as necessary. 2. Fill solenoid valve remains open - Repair or replace valve as necessary.
5. Water leaks from washer.	<ol style="list-style-type: none"> 1. Chamber door(s) not fully closed - Close and latch door(s). 2. Door gasket worn or defective - Replace gasket. 3. Window gasket worn or defective - Replace gasket. 4. Spray jets misaligned - Realign jets away from doors. 5. Water level float ball malfunctions - Verify operation of float ball. Clean or replace as necessary. 6. Too much water entering chamber - Refer to Problem # 4. 7. Piping leaks - Verify hose clamps, valves and piping. Tighten connections as necessary. 8. Exhaust dampered too much - Adjust optional automatic damper. 9. Building vent connections inadequate - Increase CFM capabilities.

Table 7-1. Operator Troubleshooting Chart - No Alarm or Printout (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
6. Vapor escaping under door(s).	<ol style="list-style-type: none"> 1. Exhaust exhaust system off - Verify operation of applicable option. 2. Building vent connections inadequate - Increase CFM capabilities.
7. Pump starts before appropriate sump water level is reached.	Water level float ball malfunctions - Verify operation of float ball. Clean or replace as necessary.
8. Pump runs with insufficient or no pump pressure.	<ol style="list-style-type: none"> 1. Vortex plate clogged - Remove debris from under plate. 2. Water level float ball malfunctions - Verify operation of float ball. Clean or replace as necessary. 3. Water temperature in excess of 195°F (91°C) - Lower temperature set point. 4. Self-cleaning screen clogged - Remove debris from screen. 5. Pump rotating in wrong direction - Verify pump rotation as indicated by arrow. 6. Foam in chamber - Rinse chamber with cold water and decrease detergent injection rate. 7. Compression fitting on pump RTD, located in suction pick-up pipe, is leaking air - Verify for leaks and improper installation. Seal leaks or correct installation as necessary.
9. Header drive system not operating properly.	Spray header jammed - Verify chamber for obstruction.
10. Washer operation stops during cycle.	<ol style="list-style-type: none"> 1. Loose connection in control wiring - Inspect all control wiring connections and tighten if necessary. 2. Electrical component failure (e.g. motor starter) - Replace applicable component. 3. Control fuse failed - Replace fuse.
11. Foam in chamber.	<ol style="list-style-type: none"> 1. Detergent is foaming - Use recommended products. 2. Too much detergent injected during Wash phase - Verify injection rate.
12. Chamber does not drain properly. <i>NOTE: 1 to 2 inches of water remains in sump after draining.</i>	<ol style="list-style-type: none"> 1. Self-cleaning screen clogged - Remove debris from screen. 2. Drain line plugged - Flush out line. 3. Defective drain valve - Repair or replace valve as necessary. 4. Drain time set too short - Lengthen programmed drain time to approximately 15 seconds past pressure drop.

Table 7-1. Operator Troubleshooting Chart - No Alarm or Printout (Cont'd)


PROBLEM	POSSIBLE CAUSE AND CORRECTION
13. Load comes out dirty.	<ol style="list-style-type: none"> 1. Empty detergent container - Replace container. 2. Incorrect detergent used - Use recommended products. 3. Spray jets clogged - Clean jets. 4. Pump suction strainer clogged - Clean strainer. 5. Water temperature in excess of 195 °F (91 °C) - Lower temperature set point. 6. Self-cleaning screen clogged - Remove debris from screen. 7. Loose hose connection on pump suction strainer - Tighten hose clamps or replace as necessary. 8. Spray jets misaligned - Realign jets toward load surfaces. 9. Pump rotating in wrong direction - Verify pump rotation as indicated by the arrow.
14. Printing defect appears consistently in the same column.	Debris trapped on the print head - Dislodge debris by removing thermal paper from printer, inserting a one-inch wide strip of bond type paper under the print head, and moving the paper in both linear and circular motions.
15. Machine will not start.	<ol style="list-style-type: none"> 1. Power Off - Turn on power (3 phase and 110 volt on panel). 2. Hot water supply off - Turn hot water supply on. 3. Door switch failure - Make sure door (s) are closed completely. 4. Faulty level sensing - Clean warrick probes in sump. 5. Blown fuse - Replace with proper size.
16. Pump pressure too low.	<ol style="list-style-type: none"> 1. Faulty level sensing - Clean water level probes in sump. 2. Temperature in excess of 195°F (91°C) - Lower set-point temperature. 3. Self-cleaning screen blocked - Remove, clean, and reinstall properly. 4. Too much soap - Rinse with cold water and decrease usage.
17. Pump pressure too high.	<ol style="list-style-type: none"> 1. Self-cleaning screen blocked - Remove, clean, and reinstall properly. 2. Plugged Jamesbury drain valve - Remove union exiting self-cleaning screen, clear obstruction, and reconnect. 3. Plugged spray jets - Poke debris  jets, remove plugs located at bottom of spray header, run spray manually, reinstall plugs.



Table 7-1. Operator Troubleshooting Chart - No Alarm or Printout (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
18. Drive not moving.	Spray header jammed - Verify inside cabinet for obstruction.
19. Machine not reaching guarantee.	<ol style="list-style-type: none"> 1. Steam supply off - Turn hot water supply on. 2. Set-point temperature too low - Raise set-point temperature. 3. Plugged steam strainer - Undo large nut on strainer, clean screen, and reinstall. 4. Stuck steam valve - Raise and lower SP on west until activated and deactivated to try and free up. 5. Poor quality steam supply - Test steam for pressure and moisture content to meet specifications. 6. Condensate line locked - Free up and verify traps. 7. Guarantee deactivated - Reactivate inside control panel.
20. Machine overheating.	<ol style="list-style-type: none"> 1. Temperature in excess of 195 °F (91 °C) - Lower set-point temperature. 2. Stuck steam valve - Raise and lower SP on west until activated and deactivated to try and free up. 3. Leaking steam unions - Tighten unions. 4. Leaking steam coil - Remove and test.
21. Sump overfilling.	<ol style="list-style-type: none"> 1. Faulty level sensing - Clean water level probes in sump. 2. Asco malfunction - Test for energizing, rebuild if necessary.
22. Sump not filling.	<ol style="list-style-type: none"> 1. Hot water supply off - Turn hot water supply on. 2. Faulty level sensing - Clean warrick probes in sump. 3. Asco malfunction - Test for energizing, rebuild if necessary. 4. Too much soap - Rinse with cold water and decrease usage.
23. Jets not spraying.	<ol style="list-style-type: none"> 1. Temperature in excess of 195°F (91°C) - Lower set-point temperature. 2. Self-cleaning screen blocked - Remove, clean, and reinstall properly. 3. Plugged spray jets - Poke debris into jets, remove plugs located at bottom of spray header, run spray manually, and reinstall plugs. 4. Jet Jamesbury ball valve out of sync - Resynchronize cams, rebuild if necessary. 5. Plugs is spray header missing - Reinstall plugs.



Table 7-1. Operator Troubleshooting Chart - No Alarm or Printout (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
<p>24. Sump not draining properly.</p> <p><i>NOTE: Drain only timer on computerized units.</i></p>	<ol style="list-style-type: none"> 1. Self-cleaning screen blocked - Remove, clean, and reinstall properly. 2. Plugged Jamesbury drain valve - Undo union exiting self-cleaning screen, clear obstruction, and reconnect. 3. Drain fill timer (DFT) set too short - Raise time until there is approximately 15 seconds past pressure drop (sound change) in pump. 4. Plugged facility drain - Rectify.
<p>25. Machine stops in alkaline cycle.</p>	<ol style="list-style-type: none"> 1. Steam supply off - Turn hot water supply on. 2. Poor quality steam supply - Test steam for pressure and moisture content to meet specifications.
<p>26. Machine will not stop.</p>	<ol style="list-style-type: none"> 1. Stuck start button - Free up start button. 2. Manual switches left on - Turn manual switches off before starting machine.
<p>27. Machine not cleaning properly.</p> <p><i>NOTE: Drain only timer on computerized units.</i></p>	<ol style="list-style-type: none"> 1. Temperature in excess of 195°F (91°C) - Lower set-point temperature. 2. Self-cleaning screen blocked - Remove, clean, and reinstall properly. 3. Plugged Jamesbury drain valve - Undo union exiting self-cleaning screen, clear obstruction, and reconnect. 4. Plugged spray jets - Poke debris into jets, remove plugs located at bottom of spray header, run spray manually, and reinstall plugs. 5. Spray header jammed - Verify inside cabinet for obstruction. 6. Drain fill timer (DFT) set too short - Raise time until there is approximately 15 seconds past pressure drop (sound change) in pump. 7. Stuck start button - Free up start button. 8. Too much soap - Rinse with cold water and decrease usage. 9. Plugs is spray header missing - Reinstall plugs.

Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout

PROBLEM	POSSIBLE CAUSE AND CORRECTION
<p>1. Screen displays: STOP BUTTON PRESSED! PUSH START TO RESUME</p> <p>and printer prints: ALARM: HH:SS:MM STOP BUTTON PRESSED!</p>	<p>STOP/RESET touch pad pressed - Press CYCLE/START touch pad to resume cycle operation, or press STOP/RESET touch pad again to abort cycle operation.</p>
<p>2. Screen displays: LOAD DOOR OPEN WHEN PROCESSING</p> <p>and printer prints: ALARM: HH:SS:MM LOAD DOOR OPEN WHILE PROCESSING</p>	<ol style="list-style-type: none"> 1. Load-side door open - Close and latch door. Press CYCLE/START touch pad to resume cycle operation. 2. If condition recurs, call STERIS*.
<p>3. Screen displays: UNLOAD DOOR OPEN WHEN PROCESSING</p> <p>and printer prints: ALARM: HH:SS:MM UNLOAD DOOR OPEN WHILE PROCESSING</p>	<ol style="list-style-type: none"> 1. Unload-side door open - Close and latch door. Press CYCLE/START touch pad to resume cycle operation. 2. If condition recurs, call STERIS*.
<p>4. Screen displays: SUMP TOO LONG IN FILL</p> <p>and printer prints: ALARM: HH:SS:MM SUMP TOO LONG IN FILL</p>	<ol style="list-style-type: none"> 1. Supply valves not fully open - Open building and washer supply valves. 2. Foam in chamber - Rinse chamber with cold water and decrease detergent injection rate. 3. Call STERIS*.
<p>5. Screen displays: SUMP TOO LONG IN DRAIN</p> <p>and printer prints: ALARM: HH:SS:MM SUMP TOO LONG IN DRAIN</p>	<ol style="list-style-type: none"> 1. Self-cleaning screen clogged - Remove debris from screen. 2. Call STERIS*.

Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
<p>6. Screen displays: SUMP RTD FAILURE and printer prints: ALARM: HH:SS:MM SUMP RTD FAILURE</p>	<ol style="list-style-type: none"> 1. Faulty RTD sensor in chamber sump - Clean as necessary. 2. Call STERIS*.
<p>7. Screen displays: SUMP WATER TEMP TOO HIGH and printer prints: ALARM: HH:SS:MM SUMP WATER TEMP TOO HIGH</p>	<ol style="list-style-type: none"> 1. Faulty RTD sensor in chamber sump - Clean as necessary. 2. Call STERIS*.
<p>8. Screen displays: SUMP FAILED TO REACH TEMP and printer prints: ALARM: HH:SS:MM SUMP FAILED TO REACH TEMP</p>	<ol style="list-style-type: none"> 1. Steam supply valve not fully open - Open building and washer supply valves. 2. Temperature set too high - Decrease programmed temperature set point. 3. Poor electrical connection between sump RTD sensor and control - Inspect connections and tighten if necessary. 4. Low dynamic steam pressure - Provide steam at pressure specified on equipment drawing. 5. Faulty RTD sensor in chamber sump - Clean as necessary. 6. Call STERIS*.
<p>9. Screen displays: UNKNOWN FAILURE DETECTED and printer prints: ALARM: HH:SS:MM UNKNOWN FAILURE DETECTED</p>	<p>Call STERIS*.</p>
<p>10. Screen displays: pH TOO LOW CHECK INJ. SYSTEM and printer prints: ALARM: HH:SS:MM pH TOO LOW CHECK INJ. SYSTEM</p>	<ol style="list-style-type: none"> 1. Acid neutralizer container empty - Verify and replace container. 2. Wrong chemical used - Verify and replace as necessary. 3. Self-cleaning screen clogged - Clean strainer (if pH is done in sump). 4. Call STERIS*.

Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
<p>11. Screen displays:</p> <p>pH TOO HIGH CHECK INJ. SYSTEM</p> <p>and printer prints:</p> <p>ALARM: HH:SS:MM pH TOO HIGH CHECK INJ. SYSTEM</p>	<ol style="list-style-type: none"> 1. Alkaline neutralizer container empty - Verify and replace container. 2. Wrong chemical used - Verify and replace as necessary. 3. Self-cleaning screen clogged - Clean strainer (if pH is done in sump). 4. Call STERIS*.
<p>12. Screen displays:</p> <p>pH CONTROLLER NOT RESPONDING</p> <p>and printer prints:</p> <p>ALARM: HH:SS:MM pH CONTROLLER NOT RESPONDING</p>	<p>Call STERIS*.</p>
<p>13. Screen displays:</p> <p>CONC. TOO LOW CHECK INJ. SYSTEM</p> <p>and printer prints:</p> <p>ALARM: HH:SS:MM CONC. TOO LOW CHECK INJ. SYSTEM</p>	<ol style="list-style-type: none"> 1. No alkaline detergent in container - Verify and replace container. 2. No acid detergent in container - Verify and replace container. 3. Call STERIS*.
<p>14. Screen displays:</p> <p>DETERGENT CONTAINER EMPTY</p> <p>and printer prints:</p> <p>ALARM: HH:SS:MM DETERGENT CONTAINER EMPTY</p>	<p>A chemical container is empty, proceed as follows:</p> <ol style="list-style-type: none"> 1. No alkaline detergent in container - Verify and replace detergent. 2. No acid detergent in container - Verify and replace detergent. 3. No acid neutralizer in container - Verify and replace detergent container as necessary. 4. No alkaline neutralizer in container - Verify and replace detergent container as necessary. 5. Defective alkaline detergent level switch (always open) - Verify and replace as necessary. 6. Defective acid detergent level switch (always open) - Verify and replace as necessary. 7. Defective alkaline neutralizer level switch (always open) - Verify and replace if necessary. 8. Defective acid neutralizer level switch (always open) - Verify and replace as necessary.

Table 7-2. Operator Troubleshooting Chart - Alarm and/or Printout (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
<p>15. Screen displays:</p> <p>SUMP COOLDOWN FAILURE</p> <p>and printer prints:</p> <p>ALARM: HH:SS:MM SUMP COOLDOWN FAILURE</p>	<p>Cooldown water level not reached and water temperature is over cooldown setpoint - Call STERIS*.</p>
<p>16. Screen Displays:</p> <p>SUMP OVERFLOW</p> <p>and printer prints:</p> <p>SUMP OVERFLOW</p>	<p>Cooldown/overflow water level is reached outside cooldown/drain- ing phase - Call STERIS*.</p>

REPLACEMENT PARTS AND PRODUCTS

8



IMPORTANT: A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.

The parts listed in this section are those that would be necessary to do minor maintenance on this washer.

When ordering replacement parts or cleaning products, please include part numbers and the descriptions as listed in **Table 8-1**. To hasten service to you, include on your order the serial, equipment and model numbers of your washer.

Table 8-1. Replacement Parts

DESCRIPTION	PART NUMBER	QTY
Common Parts:		
O-RING, Self-Cleaning Screen	P117905-503	3
FUSE 5A, 250V	P117901-328	1
FUSE 0.5A, 250V	P117940-574	1
FUSE 3A, 250V	P117909-744	1
FUSE 8A, 250V	P117909-473	1
FUSE 30A, 600V	P117033-732	3
RELAY, RT424615	P117914-766	1
SWITCH, Water Level, Madison M5010	P117903-117	1
SWITCH, Water Level, Madison M5002-6032	P1170109-220	1
RTD, 223-11341-01	P117914-352	1
DRIVER, 300 mA	P117902-411	5
RELAY, Solid State	P117902-412	5
RAM, Battery Back-Up	P122362-145	1
TUBING, Marprene, for Chemical Pump	P117950-583	2
LUBRICANT, Silicone	P117950-599	1

Table 8-1. Replacement Parts (Cont'd)

DESCRIPTION	PART NUMBER	QTY
KIT, Repair, 302-280 for Water Valve 1" brass, 117903-825/8210G4	P117950-212	1
COIL, 23881232, for Water Valve 1" brass, 117903-825/903-823	P117955-189	1
208 Volts:		
OVERLOAD, 3RU1126-4CBO	P117912-553	1
480 Volts:		
FUSE 4A, 600V	P117912-533	2
OVERLOAD, 3RU1126-1JBO	P117911-133	1
Steam Heated:		
KIT, Repair, 312-702 for Steam Valve 3/4", Brass	P117950-063	1
COIL, 23821232 for Steam Valve 3/4", Brass 117-956-361/8220G23	P1179955-189	1
STEAM TRAP, 3/4", TD52	P117950-360	1
Electric Heated:		
THERMODISC, M.210F	P117904-036	1
FUSE 45A, 600V	P117914-881	3
ELECTRICAL ELEMENTS, 480V, 10Kw	P117001-111	3
Heat Exchanger:		
KIT, Repair, 304-392 for Steam Valve 1", Brass 117950-999/822025	P117951-000	1
COIL, 23881232 for Water Valve 1", Brass 117956-360/903-823	P117955-189	1
STEAM TRAP, 3/4", TD52	P117950-360	1
Drain Discharge Cool Down:		
KIT, Repair, 302-280 for Water valve 1", Brass 117903-825/8210G4	P117950-212	1
COIL, 23881232 for Water Valve 1", 117903-825/903-823	P117955-189	1
Exhaust Fan		
GASKET, Removal Fan	P117903-068	1
EXHAUST FAN ASSEMBLY	P117908-363	1

Table 8-1. Replacement Parts (Cont'd)

DESCRIPTION	PART NUMBER	QTY
With Condenser:		
Kit, Repair 302-273 for Water Valve 1/2" Brass 117956-359/SC8210G2	P117950-174	1
COIL, 23821232 for Water Valve 1", Brass, 117956-359/SC8210G2	P117955-186	1
Vertical Rise Doors:		
GASKET, Door, Bottom	P117941-805	1
GASKET, Door, Top	P117941-810	1
SWITCH, Door, 3SE2120-1E	P117915-116	1
pH Neutralization and Detergent Monitoring System:		
pH Probe	P117909-559	1
CONDUCTIVITY PROBE	P117909-559	1